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ABSTRACT

This report summarizes the findings, issues, and lessons learned from the Developing National Public Library and Statewide Network Statistics and Performance Measures study conducted between January 1999 and August 2000. The overall goal of the study was to develop a core set of national statistics and performance measures that librarians, researchers, and policymakers can use to describe public library and library-based statewide network use of networked services and resources. Study participants identified a number of criteria for the selection, development, and collection of network statistics and performance measures. Based on these criteria, and through extensive field-testing using a number of methods, the study team developed a core set of network statistics and performance measures. Key findings, issues, and recommendations include: (1) a core set of national network statistics and performance measures is possible; (2) a number of models exist to determine which statistics to use under what circumstances; (3) network statistics are evolutionary; (4) understanding, using, and presenting network statistics and measures requires education; (5) vendor community collaboration is key; and (6) developing a national data collection system to move forward is critical. (MES)

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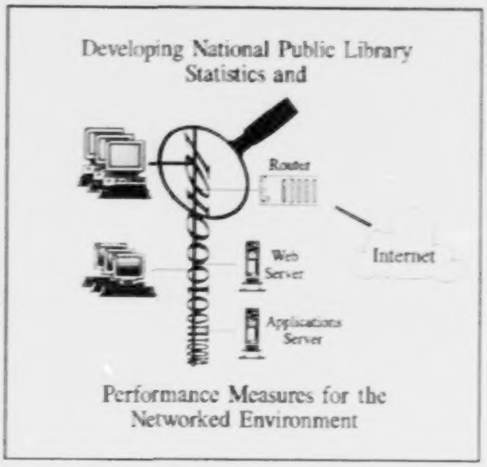
Developing National Public Library Statistics and
Router
Internet
Web Server
Applications Server
Performance Measures for the Networked Environment

DEVELOPING STATISTICS AND PERFORMANCE MEASURES FOR THE NETWORKED ENVIRONMENT:

FINAL REPORT

November 16, 2000

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EXECUTIVE SUMMARY

This report summarizes the findings, issues, and lessons learned from the *Developing National Public Library and Statewide Network Statistics and Performance Measures* study conducted between January 1999 and August 2000 (IMLS Grant LL-80102). The overall goal of the study was to develop a core set of national statistics and performance measures that librarians, researchers, and policy makers can use to describe public library and library-based statewide network use of networked services and resources. More specifically, the study had the following key objectives:

- Identify and develop a descriptive list of national statistics and performance measures that describe public library network use to include definitions, methods of collection, and intent/purpose of the elements and performance measures;
- Test and validate the statistics in a sample of public libraries in selected states with the assistance of selected state library agencies and public libraries; and
- Produce a concise manual that describes the proposed national statistics, possible performance measures that can be computed from these data elements and statistics, the techniques through which to collect the data, and considerations for analyzing and presenting network usage data.

The study developed, tested, and refined the statistics and performance measures based on a number of field-testing and validating activities.

The study focused on the development of network statistics and performance measures that would 1) aid public libraries assess the usage of their network services and resources and the local level for decision making, resource allocation, and other purposes; 2) provide scalable statistics and measures that generate statewide and national measures of public library network services resources usage; and 3) assist public librarians, state library staff, and policy makers understand the methods, techniques, and means through which to develop, collect, analyze, and present network usage statistics and performance measures through the development of a manual/guide.

Study participants identified a number of criteria for the selection, development, and collection of network statistics and performance measures. These included:

- *Measures of Capacity, Use, or Impact.* A traditional way of classifying library statistics is into input and output measures. A capacity measure describes the ability of a library to make use of a network resource or deliver a network service (e.g., the number of Internet workstations or the maximum speed of public access Internet workstations). A use measure describes the utilization of the library (e.g., the number of electronic reference transactions or visits to a library created WWW site). Impact describes the effects of library use (e.g., the number employed as a result of library network services or the number of newly literate readers as a result of library network services).
- *Measures that are Scalable.* The collection of national network statistics and performance measures implies that it is possible to collect network statistics and performance measure data at the local library level and aggregate that data on a national and international basis.

For example, the data needs to be scalable in the sense that the data collected at the local library is important and useful for that library, for the state, and at a national level.

- *Measures that are Multipurpose.* A national network measure will be used for a variety of purposes, some of which can be anticipated, at the range of levels mentioned above. These purposes include: seeking and determining library funding, planning for library services, managing resource allocation, shaping public opinion, educating the public, and developing policy, standards, sanctions and rewards.
- *Measures that can be Adaptable to Multi-Type Library Use.* A national network measure gains in power if it represents all libraries rather than a special class. A key set of national network measures may well be supplied by licensed database vendors who sell most of their products to multi-type library consortia. Local and regional libraries of different types are increasingly partnering to share network resources and services. In all these cases, a common set of network measures is an asset.
- *Measures that Minimize the Potential for Misuse.* Measures that must scale across governmental units, serve multiple purposes, and be useful across different types of libraries may have an increased potential for misuse or misinterpretation.
- *Measures that are Defined Clearly.* The range of audiences for the proposed national measures suggests the need for measures that can be unambiguously defined, particularly with regard to their method of collection. Local librarians, in particular, asked for clear definitions that included examples where possible.
- *Measures that are Useful for Decision Making.* Participants expressed a strong desire to avoid measuring something simply because one can. The danger of measuring because one can measure increases with the number and complexity of the criteria necessary to become a successful network measure.
- *Measures that Enable Comparison of Data Between Libraries.* Peer comparisons with neighbors or with libraries that share some similar characteristics, within state or out of state are one of the most popular uses of the existing annual survey statistics. Such comparisons, however, can be a blessing or a curse, as they can lead to divisiveness and ill will and/or frustration when nothing was done or could be done to raise the standard of the lower library.
- *Impact of Network Measure on Compliance with Standards, Regulations, and Laws.* All of the participating state library agencies use annual survey statistics to test compliance with various state standards (and their associated administrative regulations and laws) and in the determination of state aid to libraries. Network measures would be used as tests of compliance as well. Careful early attention is necessary to consider the likely outcomes of the use of any proposed network measure to test compliance.

Based on these criteria, and through extensive field-testing using a number of methods, the study team developed a core set of network statistics and performance measures.

Key Findings, Issues, and Recommendations

Through the research process, the study discovered a number of key findings, issues, and recommendations for the development of national public library network statistics and performance measures. These include (the ensuing report presents considerable detail and depth on the selected items highlighted here):

- *A core set of national network statistics and performance measures is possible.* As identified in Figures 1 and 2 in the report, there are a number of what could be considered core network statistics in five key public library network service and resource areas – public access workstations, instruction, virtual visits, electronic services, and databases.
- *A number of models exist to determine which statistics to use under what circumstances.* Depending on audiences to which the library and others are presenting, management needs, and other factors, the selection of network statistics and performance measures may differ.
- *Network statistics are evolutionary.* Network statistics and performance measures, particularly those in this report, are not static and will need to evolve over time as technology changes and the implementation of technology in libraries changes.
- *Understanding, using, presenting network statistics and measures requires education.* To incorporate network statistics and performance measures into library planning and evaluation activities will require librarian education in the understanding, methods, and analysis of the statistics. Likewise, library administrators, members of governance boards, and others will need education in the meaning and interpretation of such statistics.
- *Vendor community collaboration is key.* Significant data – that of online database usage – is in the hands of the vendor community. It is essential that libraries and vendors work together to generate reports and reporting formats of interest to the library community. Similarly, it is important to consider a core set of database statistics that the vendor community, as a whole, can adopt and adhere to to minimize vendor reporting requirements.
- *Developing a national data collection system to move forward.* It is critical to develop a national reporting system for public library network statistical data. The question is: what is that system and what should it look like? This question is the subject of a new IMLS-provided grant to the study team and will require resolution for there to be national statistics.

The report details additional findings and provides details on those highlighted above.

Next Steps

The research into network statistics and performance measures continues:

- The study team continues to maintain the project website initiated by this study (though now moved to a different location <http://www.ii.fsu.edu/Albany_IMLS_Webfiles/public_html/>).
- The study team reviews new technologies and the implication for those technologies in the development and presentation of network statistics and measures.
- Individuals on the study team have involvement in a number of research projects reviewing, developing, and implementing network statistics and performance measures in a number of library settings.
- Members of the study team continue to work with vendors and others working in the area of library network statistics and performance measures both in the U.S. and internationally.

- The study team is engaged in a new effort to develop a model for national public library data collection.

These efforts will continue the process begun by this research project – the development of library network statistics and performance measures. Moreover, such efforts will facilitate across library definitions, methods, and reporting techniques as well as coordinate, where possible, efforts in this area by various groups (e.g., academic libraries, consortia, vendors, and publishers).

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We also wish to thank the state librarians and state library staff at Utah, North Carolina, Pennsylvania, Michigan, Maryland, and Delaware for also supporting the study. These six state library agencies contributed both resources and staff to allow the study team to conduct a range of in-depth on-site visits and other data collection efforts to test the various statistics and performance measures described in this report and the American Library Association (ALA)-published manual, *Statistics and Performance Measures for Public Library Networked Services* (Bertot, McClure, and Ryan, 2001).

Within these, and other states, a number of public librarians agreed to work directly with the study team to identify their needs and uses for statistics and measures to describe the networked environment; to test and refine the proposed statistics and measures; and to explain to the study team various strengths, weaknesses, and potential uses of the statistics and measures. The range of people, "in the trenches," who offered valuable ideas, suggestions, and insights is extensive. We especially appreciate the assistance of the field test liaisons: Jane Gill, Karen Sherrard, Anne Silvers Lee, and David Wilson. While we cannot list all the participants here, their assistance was essential to the completion of the study.

We also gratefully acknowledge the assistance and input from members of the project's advisory committee (see Appendix B for a complete listing of those individuals). We would also like to thank the U.S. National Commission on Libraries and Information Science for the valuable contribution – particularly by Ms. Denise Davis – the Commission made in supporting the research efforts with the online database vendors. Finally, we would like to thank the ALA publications staff who assisted in the production of the manual. Particularly helpful were, Mary Huchting, Marlene Chamberlain, Anne Gleason, and Patrick Hogan.

We also wish to acknowledge a number of people who were part of the study team over the project's duration. We especially want to thank Colleen Ostiguy, Research Assistant at SUNY Albany for all her hard work on the project, for managing the project website, handling a range logistical issues and always with good humor.

While the authors gratefully acknowledge all the various folks that contributed to the success of the project and the completion of the project and manual publication, the responsibility for the recommendations of the project belongs to the authors. There is still considerable room for debate, discussion, and ongoing evolution of the statistics and measures presented here. We look forward to working with others to continue this evolution.

John Carlo Bertot
Charles R. McClure
Joe Ryan
November 2000

INTRODUCTION

This report summarizes the findings, issues, and lessons learned from the *Developing National Public Library and Statewide Network Statistics and Performance Measures* study conducted between January 1999 and August 2000 (IMLS Grant LL-80102). This report has the following objectives:

- Describe project research activities;
- Summarize the findings from the study team's various data collection activities;
- Present the identified network statistics and performance measures;
- Review project goals and objectives and the extent to which the study achieved those goals and objectives; and
- Identify next steps and future directions for implementing a national model for collecting network statistics and performance measures in the public library community.

This report, therefore, details project activities and results.

Study Importance and Significance

The development of national public library networked statistics and performance measures is an important undertaking that receives continued and increased attention and support. There is a broad recognition for the need of such statistics and performance measures that:

- Assist libraries make a strong case for support for technology and information infrastructure by documenting their Internet-based services and resources;
- Allow libraries to compare effectively themselves to others in terms of Internet development, costs, provision of services, connectivity, and use;
- Enable library directors and administrative library agencies compete for resources with other organizations and/or departments by documenting the range, extent, and impact of library-provided networked services;
- Facilitate the transition from traditional library use measures such as circulation, reference transactions, interlibrary loans, etc., to network measures that describe the nature and use of library-based network activities and resources;
- Provide a decision-making framework for library staff, managers, and administrators to determine resource allocation strategies and meet other management needs; and
- Provide a means through which to measure the quality of library services and resources in the networked environment.

These and other factors point to the overall importance for research that generates public library network statistics and performance measures.

This study focused on the development of network statistics and performance measures that would 1) aid public libraries assess the usage of their network services and resources and the local level for decision making, resource allocation, and other purposes; 2) provide scalable statistics and measures that generate statewide and national measures of public library network services resources usage; and 3) assist public librarians, state library staff, and policy makers understand the methods, techniques, and means through which to develop, collect, analyze, and present network usage statistics and performance measures through the development of a manual/guide.

Study Objectives

The overall goal of the study was to develop a core set of national statistics and performance measures that librarians, researchers, and policy makers can use to describe public library and library-based statewide network use of networked services and resources. More specifically, the study had the following key objectives:

- Identify and develop a descriptive list of national statistics and performance measures that describe public library network use to include definitions, methods of collection, and intent/purpose of the elements and performance measures;
- Test and validate the statistics in a sample of public libraries in selected states with the assistance of selected state library agencies and public libraries; and
- Produce a concise manual that describes the proposed national statistics, possible performance measures that can be computed from these data elements and statistics, the techniques through which to collect the data, and considerations for analyzing and presenting network usage data.

The study therefore developed, tested, and refined the statistics and performance measures based on a number of field-testing and validating activities. Additional information about the project, including a study abstract and various study documents, can be found at <http://www.ii.fsu.edu/Albany_IMLS_Webfiles/public_html/>.

Overview of Study Methodology

The study used a multi-method approach to the development of national network statistics and performance measures. The data collection efforts encompassed a variety of data collection activities that involved library researchers, practitioners, policy makers, state library agencies, state library data coordinators, online database vendor representatives, and public library administrators and staff. In particular, the study team:

- Worked with six (6) states throughout the data collection process (Delaware, Maryland, Michigan, North Carolina, Pennsylvania, and Utah). Within the states, the study team conducted site visits, focus groups, interviews, and surveys to assist in identifying, defining, and operationalizing the statistics and performance measures. Libraries within the states also served as the test-bed sites for testing and refining the initial statistics and performance measures.
- Established a study advisory committee comprised of public librarians, state library officials, vendors, library professional organization officials (e.g., Urban Libraries Council, American Library Association), and policy makers to guide study research activities, identify network usage statistics and performance measures, pre-test data collection tools, and provide other advisory activities.

- Conducted focus groups, surveys, and interviews at ALA Midwinter 1999 and 2000, ALA Annual Conference in 1999 and 2000, the Public Library Association's March 2000 meeting, and the Federal State Cooperative System (FSCS) annual training workshop meetings in 1999 and 2000. Participants in the focus groups included public librarians, state library agency administrators and data coordinators, state librarians, vendors, policy makers, IMLS representatives, and others. The topics of the focus groups included desired data for decision making purposes, preliminary identification and definition of network statistics and performance measures, field-test implementation strategies, online database vendor data collection strategies, and the selection of final statistics and performance measures.
- Conducted numerous interviews with state data coordinators, project principals of similar measurement efforts (e.g., Equinox in Europe, International Standards Organization efforts to incorporate network measures into library statistical collection efforts), and participants at a number of state and local library association, consortium, or related meetings. These interviews served to coordinate international network measurement activities to the extent possible, verify study research activities, gain a broader perspective on the types and nature of network statistics and measures most useful, and build consensus on the statistics and measures, their definitions, and the means through which to capture and report data.
- Conducted focus groups, interviews, and presentations with a number of local and state library association meetings, FSCS working committees, and others upon the completion of the study to evaluate the study's research process, products, and network statistics and performance measures. These activities also served to identify the next steps in implementing a national system of developing, collecting, and reporting national statistics and performance measures beyond the life of the project.

Together, these various data collection efforts yielded a robust and multi-method approach to developing a core set of national network statistics and performance measures for public libraries. More detailed information regarding specific data collection instruments and tools is available in Appendix A.

The Role of the States

As indicated above, the study team worked extensively with six (6) states throughout the study. The selection of these states was based on the following criteria:

- Willingness to participate in a multi-phase and longitudinal data collection effort;
- Ability to provide the study team feedback on various study data collection instruments and efforts;
- Ability to inform the study team of the issues identified in collecting network statistics and performance measures;
- Diversity of network resources and services implementation within the state library and public libraries throughout the state; and
- Willingness to spearhead network statistics and performance measure adoption efforts, first in their states, and then on the national level.

The states served as study advisors, participants, and testbeds.

The ensuing sections present detailed study activities, findings, study evaluation activities, future directions, and supporting documentation.

STUDY ACTIVITIES

The study team engaged in a number of activities throughout the duration of the study to develop, test, and finalize the network statistics and performance measures in Figures 1 and 2. These activities included:

- **Project planning and advisory committee** – October 1998-January 1999. The researchers assembled a study team during this phase of the project, mapped broadly project activities, established a project advisory committee (see Appendix B), identified the six states that would participate in the study, and developed a project web site. These activities culminated in the first meeting of the advisory committee at the 1999 ALA Midwinter meeting.
- **Preliminary identification of network statistics and measures** – January 1999-March 2000. During this phase of the project, the study team reviewed related literature and identified related research activities nationally as well as internationally. These efforts produced a number of possible statistics and performance measures to capture the use of public library networked resources and services. Appendix C shows the initially identified network statistics and performance measures.
- **Site visit planning and execution** – April 1999-June 1999. The study team worked with liaisons in the six state library agencies to identify public libraries, consortia, vendors, and other relevant individuals/entities with whom to meet and/or coordinate site visit and data collection activities. Within the states, the study team met with state library personnel, public librarians, government officials, members of governing boards, vendor representatives, consortia managers, and others to gain an understanding of data collection needs, management decision making needs, and issues related to network statistics and performance measures. The study team also used the site visits to winnow a substantial list of possible statistics and measures to a core set for field-testing.
- **Field test planning and execution** – July 1999-December 1999. Working with the state library liaisons as well as liaisons within participating libraries, the study team developed a field-testing methodology for the statistics and performance measures. Each statistic was tested by at least two participating public libraries that differed in size, technology architecture, and metropolitan status (urban, rural, suburban) to account for variations in public libraries (see Figure 4). Each field-test liaison was sent a set of instructions that detailed the statistic(s), its definition, the process through which to collect data regarding the statistic, and the process through which to report the data. In addition, each field-test liaison completed a questionnaire regarding the collection process (e.g., burden), utility of the statistic, and any recommended modifications to the definition or collection process. Appendix D details the field-test procedures, methods, and considerations.

Figure 1. Public Library Network Statistics.

Proposed National Statistic	Definition
Public Access Workstations	
# Public access workstations	Annual count of the number of library owned public access graphical workstations that connect to the Internet for a dedicated purpose (to access an OPAC or specific database) or multiple-purposes.
# Public access workstation users	Annual count of the number of users of all of the library's graphical public access workstations connected to the Internet computed from a one week sample.
Maximum speed of public access Internet workstations	Indication of the maximum bandwidth of public Internet access, e.g., less than 56kbps, 56kbps, 128kbps, 1.5mbps, etc.
Databases	
# Full text titles available by subscription Report: Serial titles, Other titles, Total titles	Count of the number of full text titles that the library subscribes and offers to the public computed one time annually.
# Database sessions	Total count of the number of sessions (logins) initiated to the online databases. Definition adapted from proposed ICOLC standard http://www.library.yale.edu/consortia/webstats.html.
# Database queries/searches	Total count of the number of searches conducted in the library's online databases. Subsequent activities by users (e.g., browsing, printing) are not considered part of the search process. Definition adapted from proposed ICOLC standard http://www.library.yale.edu/consortia/webstats.html.
# Items examined using subscription services	Count the number views to each entire host to which the library subscribes. A view is defined as the number of full text articles pages, abstracts, citations, and text only, text/graphics viewed. Definition adapted from proposed ICOLC standard http://www.library.yale.edu/consortia/webstats.html.
Electronic Services	
# Virtual reference transactions	Annual count of the number of reference transaction using the Internet. A transaction must include a question received electronically (e.g., via e-mail, WWW form, etc.) and responded to electronically (e.g., e-mail).
Public service time spent servicing information technology Report: Information technology staff, Paid public service staff (Professional Librarian, Paraprofessional), Volunteer, & Total	Annual count of the staff hours spent in servicing information technology resource and service activity in public service areas computed based on a one week sample.
Virtual Visits	
# Virtual visits to networked library resources Report: # Internal virtual visits, # External virtual visits, # Total virtual visits	Count of visits to the library via the Internet. A *visit* occurs when an external user connects to a networked library resource for any length of time or purpose (regardless of the number of pages or elements viewed). Examples of a networked library resource include a library OPAC or a library web page. In the case of a user visit to a library web site a user who looks at 16 pages and 54 graphic images registers one visit on the Web server.
Instruction	
User information technology instruction Report: # Users instructed, # Hours of instruction	A Count of the number of users instructed and the hours of instruction offered in the use of information technology or resources obtainable using information technology in structured, informal, and electronically delivered instruction sessions conducted or sponsored by the library.
Staff information technology instruction Report: # Staff instructed, # Hours of staff instruction	Annual count of the total number of staff instructed and the number of hours of formal instruction in the management or use of information technology or resources obtainable using information technology.

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Figure 2. Public Library Network Composite and Performance Measures.

Composite/Performance Measure	*Definition*
Public access Internet workstation in proportion to the legal service area population	The ratio of the *legal service area population* to *# Public access Internet workstations*. E.g., XYZ library provides 1 public access Internet workstation per 3,000 legal service population.
Average annual use per public access Internet workstation	The ratio of the *# public access Internet workstation users* to the *# public access Internet workstations*.
Total reference activity	Combine traditional measures of reference service with electronic measures.
% Virtual reference to total reference questions	Percentage of *# virtual reference transactions* to total reference questions (both traditional and virtual).
User information technology instruction as % of total reference activity	The *# users instructed in information technology* as a percent of *total reference activity*.
Level of paid public service effort in servicing information technology	Percentage of paid public service staff time spent serving the public that is spent servicing information technology during a sample period.
Total library materials use	This composite measure combines the circulation and use figures for all of the paper, multimedia and electronic collections that the public library owns or provides access.
% Electronic materials use of total library materials use	Compares electronic materials use in the form of *# Items examined using subscription services* with the *total library materials use*.
Total number of serial titles offered	Count of paper based serials titles added to *# Full text serial titles available by subscription*
% serial titles offered in electronic form	Compares *# Unique electronic full text serial titles available by subscription* to the *Total number of serial titles offered*.
Total library visits	Physical attendance at the library and *# virtual visits* combined into one total.
% Remote library visits	The percent of virtual visits to total library visits (virtual plus physical library visits).
% legal service area population receiving information technology instruction	The percentage of the *legal service area population* receiving information technology instruction annually from the public library.
Hours of formal information technology instruction per staff member	The average number of hours of formal information technology instruction a public library staff member receives per year.
# Users of electronic resources and services	This composite figure adds *# Virtual visits to networked library resources*, *# Users instructed in information technology* and the *# Virtual reference transactions*.

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Figure 3. Field Test Sites and Data Elements.

	Delaware	**Maryland**			**Michigan**	**North Carolina**	**Pennsylvania**		**Utah**
	State Library	*BCPL*	*Anne Arundel*	*Sailor*	*Library 1*	*NC LIVE*	*Free Library*	*Bethlehem*	*Library 1*
Public Access Workstations					X				X
Databases	X			X		X			
Electronic Services			X		X				
Virtual Visits	X	X					X		
Training	X							X	X

○ **Online vendor database data collection**. A key component to the field test centered on online vendor database data. This portion of the study required a separate data collection effort as the participating libraries did not control directly their online database usage data – the vendors did. Appendix E details the process through which the study team engaged in the vendor database field test. The U.S. National Commission on Libraries and Information Science (NCLIS) played a key role in the study team's work with the vendors, from hosting focus groups to working groups to assisting in the data collection process.

- **Finalize and validate the statistics and performance measures** – January 2000-May 2000. The field-test phase of the study yielded a variety of issues, concerns, and recommendations for the development of a final core set of national public library network statistics and performance measures. The study team engaged in a systematic review of the findings and developed a near-final set of statistics and performance measures, complete with definitions, data collection methods, and outstanding issues regarding the statistics and measures. The study team presented this list in a number of public forums to solicit feedback and guide the final statistics and measures selection process, to include definitions and methods of collection. Presentations and public forums occurred at the March FSCS training workshop, March Public Library Association conference, July American Library Association annual meeting, and a number of state and local library association meetings, panels, and workshops.
- **Produce network statistics and performance measurement manual** – May 2000-October 2000. Based on the study research activities, research findings, data collection approaches, identified issues, and recommendations, the study team developed a concise manual to assist public librarians collect, analyze, and present the recommended network services and resources usage data. Copies of the manual, published by the American Library Association, accompany this report to IMLS (Bertot, J.C., McClure, C.R., and Ryan, J. (2001). *Statistics and performance measures for public library networked services*. Chicago, IL: American Library Association. ISBN: 0-8389-0796-2).
- **Evaluate the project process and products** – March 2000-December 2000. The study team conducted a number of evaluation activities to assess the extent to which the process for developing national network statistics and performance measures was successful as

well as the study objectives were attained. These evaluation activities are discussed in more detail in the *Study Evaluation* section of the report.

The number of research activities in which the study team engaged yielded a number of findings related to the development and implementation of national public library network statistics and performance measures. The following section of the report details selected study findings and issues.

FINDINGS, ISSUES, AND CONSIDERATIONS

Together, the study's data collection efforts indicated that there are a number of models for the development of network statistics; a number of ways to define, collect, and use network statistics; a variety of data collection, managerial, and technical issues that require resolution for the development and collection of network statistics; and differing views and opinions as to the requirements, management, and coordination of national data collection efforts.

Network Measures Selection Criteria

Study participants identified a number of criteria for the selection, development, and collection of network statistics and performance measures. These include:

- *Measures of Capacity, Use, or Impact.* A traditional way of classifying library statistics is into input and output measures. A capacity measure describes the ability of a library to make use of a network resource or deliver a network service (e.g., the number of Internet workstations or the maximum speed of public access Internet workstations). A use measure describes the utilization of the library (e.g., the number of electronic reference transactions or visits to a library created WWW site). Impact describes the effects of library use (e.g., the number employed as a result of library network services or the number of newly literate readers as a result of library network services).
- *Measures that are Scalable.* The collection of national network statistics and performance measures implies that it is possible to collect network statistics and performance measure data at the local library level and aggregate that data on a national and international basis. For example, the data needs to be scalable in the sense that the data collected at the local library is important and useful for that library, for the state, and at a national level.
- *Measures that are Multipurpose.* A national network measure will be used for a variety of purposes, some of which can be anticipated, at the range of levels mentioned above. These purposes include: seeking and determining library funding, planning for library services, managing resource allocation, shaping public opinion, educating the public, and developing policy, standards, sanctions and rewards.
- *Measures that can be Adaptable to Multi-Type Library Use.* A national network measure gains in power if it represents all libraries rather than a special class. A key set of national network measures may well be supplied by licensed database vendors who sell most of their products to multi-type library consortia. Local and regional libraries of different types are increasingly partnering to share network resources and services. In all these cases, a common set of network measures is an asset.

- *Measures that Minimize the Potential for Misuse.* Measures that must scale across governmental units, serve multiple purposes, and be useful across different types of libraries may have an increased potential for misuse or misinterpretation.
- *Measures that are Defined Clearly.* The range of audiences for the proposed national measures suggests the need for measures that can be unambiguously defined, particularly with regard to their method of collection. Local librarians, in particular, asked for clear definitions that included examples where possible.
- *Measures that are Useful for Decision Making.* Participants expressed a strong desire to avoid measuring something simply because one can. The danger of measuring because one can measure increases with the number and complexity of the criteria necessary to become a successful network measure.
- *Measures that Enable Comparison of Data Between Libraries.* Peer comparisons with neighbors or with libraries that share some similar characteristics, within state or out of state are one of the most popular uses of the existing annual survey statistics. Such comparisons, however, can be a blessing or a curse, as they can lead to divisiveness and ill will and/or frustration when nothing was done or could be done to raise the standard of the lower library.
- *Impact of Network Measure on Compliance with Standards, Regulations, and Laws.* All of the participating state library agencies use annual survey statistics to test compliance with various state standards (and their associated administrative regulations and laws) and in the determination of state aid to libraries. Network measures would be used as tests of compliance as well. Careful early attention is necessary to consider the likely outcomes of the use of any proposed network measure to test compliance.

Models for Developing Network Statistics and Performance Measures

The study identified numerous models to use as a framework for developing statistics and performance measures (see Table 1 and Figure 2). Each model presents a different lens for developing statistics and performance measures. At this point, the study team is not indicating which model is the most appropriate – indeed, preliminary indications are that no one model is best; rather, each has its utility and can serve to provide a useful means for the development of statistics and performance measures. Moreover, there is a sense that it is possible to combine aspects of the models to generate statistics and measures.

The Network Component Model

As first described by Bertot and McClure (1998), this model provides a two-dimensional framework for the development of electronic statistics and performance measures (see Table 1). This model suggests that there are numerous components to electronic measures:

- **Technical infrastructure**: The hardware, software, equipment, communication lines, and technical aspects of the network (e.g., workstations, modems, servers);
- **Information content**: The information resources available on the network (e.g., local government information, special collections);
- **Information services**: The activities in which users can engage and the services that users may use to complete various tasks (e.g., EbscoHost, UnCover, online applications);

- **Support**: The assistance and support services provided to help users better use the network (e.g., training, help desk); and
- **Management**: The human resources, governance, planning, and fiscal aspects of the network (e.g., network staff, advisory boards, budgeting).

In addition, there are different types of evaluation criteria that are possible to describe public library Internet-based use and services:

- **Extensiveness**. How much of a service the network provides (e.g., number of users accessing a Web page per week, number of remote dial-ins per week);
- **Efficiency**. The use of resources in providing or accessing networked information services (e.g., cost per session in providing access to remote users of an online database, or average number of times users are unable to successfully connect to the library's servers);
- **Effectiveness**. How well the networked information service met the objectives of the provider or the user (e.g., success rate of identifying and accessing the information needed by the user);
- **Service quality**. How well a service or activity is done (e.g., percentage of transactions in which users acquire the information they need);
- **Impact**. How a service made a difference in some other activity or situation (e.g., the degree to which network users enhanced their ability to gain employment or pursue business);
- **Usefulness**. The degree to which the services are useful or appropriate for individual users (e.g., percentage of services of interest to different types of user audiences); and
- **Adoption**. The extent to which institutions or users integrate and adopt electronic networked resources or services into organizational or individual activities (e.g., answering reference questions, generating inter-library loan requests).

These types of criteria provide an important roadmap for thinking about the type of data elements and statistics that would be needed to produce such measures.

Table 1. The Network Component Model.

	Network Evaluation Criteria						
	Extensiveness	**Efficiency**	**Effectiveness**	**Service Quality**	**Impact**	**Usefulness**	**Adoption**
Network Component							
Technical Infrastructure							
Information Content							
Information Services							
Support							
Management							

The Audience Model

In this approach, the consumer of the data is the primary lens for the development and collection of network statistics and performance measures (see Figure 4). Identified audiences include:

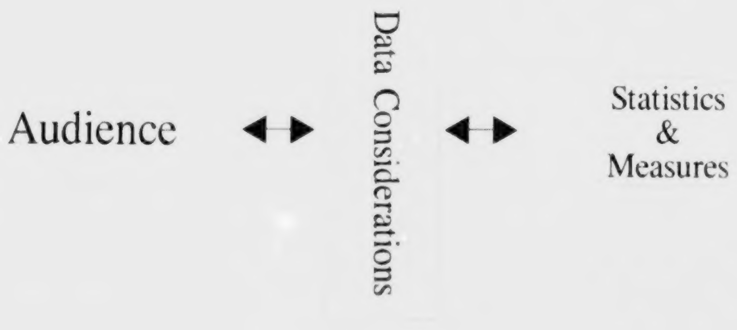
- Library governance boards;
- Local government officials (city, municipal, county);
- State government officials (legislative and executive);
- Fundors (primarily external funding entities such as granting institutions);
- National policy making groups (e.g., Congress, Executive agencies);
- Professional organizations (e.g., ALA, PLA); and
- Researchers.

Considerations for each of these audiences in terms of the statistics and measures are:

- Informational needs;
- Ability to interpret the data;
- Utility of the data for decision making, policy formation, or other purposes; and
- Comparability to other organizations under the purview of the audience members that engage in network-based activities (e.g., other city/county agencies that provide Web-based services).

Together, the audience and the audience factors combine to form the basis for the development of network statistics and performance measures.

Figure 4. Audience Model for Developing Network Statistics and Performance Measures.



The Technology Infrastructure Model

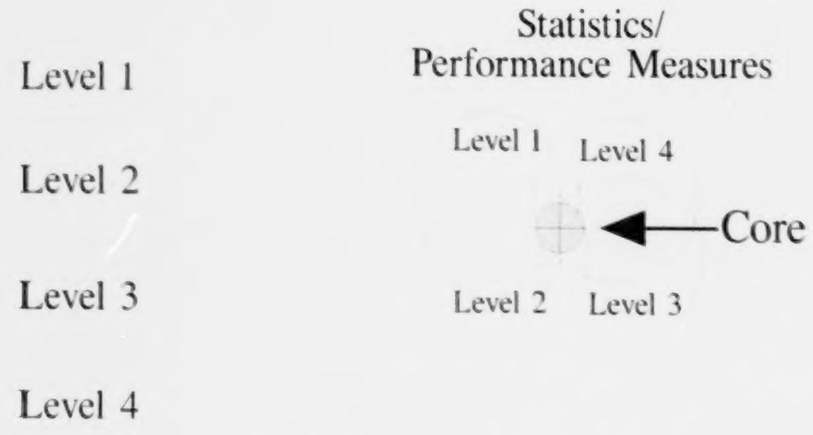
At present, public libraries and state library agencies have vastly differing levels of installed information technology infrastructure, level of services and content running over that infrastructure, and different plans for the development of library and state technology architectures. These differing levels of technology implementation have a direct impact on the relevance, feasibility to collect, and ability to use network statistics and performance measures. Thus, it is possible to develop statistics and performance based on a library's or state library agency's current state of technology infrastructure (see Figure 5).

Based on discussions with study participants, reviews of the literature (see http://www.nysl.nysed.gov/libdev/edl/thirdpln.htm/, for example), and research conducted by the authors in previous studies (see, for example, Bertot and McClure, 1996; McClure, Bertot, and Beachboard, 1995), it is possible to identify stages of technology implementation at the library level. A rough means to categorize these levels are:

- **Level 1** – Stand-alone public access workstations that offer dial-up access to the Internet. Workstation may also provide access to CD-ROM-based material. May have access to online (Internet) databases through library subscription, but more likely through the state library's licensing agreement;
- **Level 2** – Stand-alone public access workstations with dial-up connectivity to the Internet, plus a local area network that may also offer public Internet access through a dedicated leased-line connection. CD-ROM material access may be through network or single workstations. May have access to online (Internet) databases through library subscription as well as through the state library's licensing agreement;
- **Level 3** – Networked facilities with leased-line access to the Internet. CD-ROM material access through network or single workstations. Access to online (Internet) databases through library subscription as well as through the state library's licensing agreement. Library has a Web presence; and
- **Level 4** – Networked facilities with leased-line access to the Internet. CD-ROM material access through network or single workstations. Access to online (Internet) databases through library subscription as well as through the state library's licensing agreement. Library has a Web presence and is developing unique content and resources for the site.

Each level indicates a differing data collection and measurement need, level of effort required to collect the data, and an augmented level of understanding of technology and statistics to understand truly the meaning of the captured electronic data. The extent to which it is possible to develop a core set of network statistics and performance measures that are relevant, useful, and informative across all levels of technology infrastructure remain unclear at this time.

Figure 5. Technology Infrastructure Model.



Composite Model

While each of the above models – Network Component, Audience, and Technology Infrastructure – provides some notion of mutual exclusivity to the development, collection, maintenance, and interpretation of network statistics and performance measure, it is also possible to combine aspects of each model for the creation of network statistics and performance measures.

Thus, public libraries and state library agencies may consider the audience of the intended statistics and performance measures while simultaneously considering the network components and evaluation criteria presented in the Network Component Model. Another approach might be to overlay the Technology Infrastructure Model on the Network Component Model, developing measures and statistics that account for the technology infrastructure of the library or state library agency for aspects (e.g., technology, technical support) of the network.

The above models represent selected lenses for developing network statistics and performance measures identified by the study team thus far. There are likely other models that would provide libraries and state library agencies with a tool to develop network statistics and performance measures.

The study's data collection activities identified several key conceptual, methodological, definitional, and other key issues regarding the development, implementation, management, and collection of national network statistics and performance measures. These issues are identified and discussed below. Table 2 summarizes the issues.

Conceptual Issues

Different Models/Frameworks for Developing National Network Statistics and Performance Measures

There are a number of research models and frameworks for developing, defining, and measuring network statistics and performance measures. Each approach can affect the types of statistics and measures developed, the nature and use of those statistics and measures, the methodologies used to collect the statistic and measure data, and the presentation and interpretation of statistics and measure data.

The way in which one frames or models approaches to develop a process for collecting and reporting national public library statistics and performance measures has a significant affect on which data to collect, how to organize the collecting process, and determining appropriate roles of key or lead state and federal agencies. For example, the study team currently is exploring a model that relies on Federal leadership, another on state leadership, and still another in which the statistics collecting and reporting process is "outsourced" to a non-governmental organization.

Other models or approaches for studying this topic offer different means to fund such a national effort in a time when all government units (including local public libraries) appear to be extremely pressed to meet current commitments – to say nothing about supporting new responsibilities in the area of national data collection. These various models will need to be detailed and analyzed against a set of meaningful criteria to determine which of the approaches offers the best set of benefits to the various stakeholder groups participating in the process of developing this process.

Core Statistics and Measures

Is it possible to develop a limited number of core statistics and performance measures (6-8) that most states and libraries can agree upon for national data collection? Can this core set of statistics be part of a larger menu (12-15 additional statistics) from which libraries and states may select additional statistics and measures for collection and reporting?

The findings from the site visits clearly confirm that local libraries do not have the time, expertise, or interest in committing significant resources to collecting data on a range of networked services and resources. The study team also found that proposed "core" networking statistics varied in usefulness from library to library and from state to state. Nonetheless, if the

Table 2. Issues in Developing National Statistics and Performance Measures for the Networked Environment.

Issue	Description
Conceptual Issues	
Different Models/Frameworks for Developing National Network Statistics and Performance Measures	There are a number of research models and frameworks for developing, defining, and measuring network statistics and performance measures. Each approach can affect the types of statistics and measures developed, the nature and use of those statistics and measures, the methodologies used to collect the statistic and measure data, and the presentation and interpretation of statistics and measure data.
Core Statistics and Measures	Is it possible to develop a limited number of core statistics and performance measures (6-8) that most states and libraries can agree upon for national data collection? Can this core set of statistics be part of a larger menu (12-15 additional statistics) from which libraries and states may select additional statistics and measures for collection and reporting?
Methodology Issues	
New and Variant Methodologies	Network statistic and performance measure require researchers and professionals to consider the benefits and/or necessity of using traditional qualitative and quantitative methodologies (e.g., focus groups, interviews, surveys), adapting traditional methodologies (e.g., pop-up Web-based surveys), or creating new methodologies (e.g., Web-based transaction log analysis) to capture network usage data.
Data beyond the Control of Libraries and States	Libraries and states are engaging in substantial licensing agreements for Internet-based database access with vendors (e.g., OCLC, Ebsco, UMI, Gale/IAC). At present, libraries and states are dependent upon the vendors to provide them with database usage statistics.
Samples rather than Populations	To promote timely and responsive statistics and performance measures more reliance on carefully developed samples rather than 100% population responses may be needed. Such may be needed at the local, state, and national levels.
Move to Qualitative Data	To address a range of performance issues related to using networked information resources and services it may be necessary to increase the reliance on collecting, analyzing, and reporting various qualitative data.
Estimates of Networked Services	There are limited reliability and validity checks that can be established over the data collection process. There needs to be recognition that any of the statistics and performance measures likely to be proposed for the networked environment will also result in *estimates* and will have varying levels of accuracy depending on how they are collected and reported.
Definitional Issues	
Defining Networked Services	Currently using: Those electronic information resources and/or services that users access at a public, regional, or statewide library network. Examples of electronic network resources include: public, regional, or state library hosted or authored Web sites or library or licensed databases (e.g., Infotrac, SearchBank, EbscoHost). Examples of electronic network services include: provision of access to networks via public access workstation or dial in/remote access; network services such as email, listservs, chat, online reference/assistance; and training in the use of these resources and services. While there is agreement that networked statistics and performance measures must have clear and easily understandable definitions, many of these terms are complex and may require detailed definitions with detailed examples. Some of these definitions may have to include a bit of arbitrariness as there are competing possible definitions – none of which are compelling.
Developing and Defining Network Statistics and Performance Measures	Development of preliminary list of statistics/performance measures based on research/review of state library Web sites.
Rethinking "Population Served:"	In the networked environment, the "legal population served looses meaning since anyone from the around the word can access and obtain services off, for example, a library Website. Thus, traditional measures that index service provision or costs to legal population served (some local geographical area) may be inappropriate. It is unclear how such "per capita" measures can be translated into the networked environment.

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Table 2. Issues in Developing National Statistics and Performance Measures for the Networked Environment (cont'd).

Use of Networked Statistics and Performance Measure Issues	
Issue	**Description**
Evolving Development of Statistics and Performance Measures	The process of developing network statistics and performance measures is evolutionary. As a result, the study team continues to refine network statistic and performance measure definitions, the statistics and measures of interest and use, and methodological issues regarding the collection and presentation of network statistics and measures based on the various data collection activities the study team undertakes.
Implications for Longitudinal Aspects of Network Statistics and Performance Measures	The rapidly changing nature of information technology will have a substantial impact on the life cycle of the network statistics and performance measures developed through this study (as well as those efforts undertaken by others working in this area). It is very likely that it will not be possible to have longitudinal data that extends beyond 3-5 years -- at most.
Coordinating the Development of Network Statistics and Performance Measures	The importance of capturing library network services usage data is an issue with which numerous national and international library professional organizations, standards development committees, researchers, library organizations, library consortia and coalitions, and consultants have been wrestling substantially in recent times. These efforts yield, unfortunately, often uncoordinated approaches to the development of statistics and performance measures, differing statistic and measure definitions, variations on elements for data collection that reflect local/organizational issues and context, and the adoption of different data collection techniques.
Comparability of Numbers Across Libraries and States	Qualifications may be needed to explain the conditions and situations under which the data were collected, analyzed and reported as context for any type of comparability across libraries or across states.
Reporting back to Libraries	Until the states and national agencies do a better job of analyzing and reporting back to individual libraries statistics that are timely and useful for decision making, there will be limited commitment to collecting such data. Successful reporting back to individual libraries will require customized analyses, intended to assist them in local decision making, done in a very timely fashion.
Library Technology and Uses Issues	
Technology Infrastructure and Configuration	Based on the research conducted thus far by the study team, no two libraries have the same information technology infrastructure, configuration, or systems implementation. Moreover, while libraries may use similar applications and hardware, no two are implemented in the same manner. This creates a substantial challenge for the collection of the ***same data*** from libraries using similar (but different) technology in various configurations.
My Technology, My Outlook	A library facility's infrastructure and use of technology leads to a local view of network statistics. That is, study participants base their need for electronic network statistics on their facility's use of and involvement with network resources and services. As such, it is often difficult for individual libraries to see the need for certain statistics and performance measures that do not ***directly reflect*** their facility's current implementation and use of various network services and resources.
Data Collection Issues	
Automated Data Collection	From both a Web-based environment as well as a vendor-supplied database environment, there is a need for networked services and resources to be described automatically and unobtrusively by the system itself rather than through overt data collection efforts on the part of state libraries and individual libraries.
Working with Vendors	Related to the issue above is the need for the library community to be more forceful in detailing contract language that requires database vendors to be better able to supply specific types of statistical information from the use of these databases. Increasingly, the library community will be dependent on statistics from vendors if such statistics are to be obtained.

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Table 2. Issues in Developing National Statistics and Performance Measures for the Networked Environment (cont'd).

Issue	Description
Data Collection Issues (cont'd)	
Statistics to Address Policy Issues	The statistics and performance measures needed from year to year to address state and national policy issues are likely to vary. A national statistical system needs to be "fleet footed" enough to be able to both anticipate and respond timely to such policy issues affecting library services.
Composite/Unit of Service Approach	Many libraries and state library agencies are looking for some type of single/composite measure that captures the *Units of Service* that a library provides, rather than a single count/statistics that focuses on a single measure of library services (e.g., circulation). Such an approach removes the reliance upon single service measures such as circulation as indicators of library service consumption. The extent to which a composite measure that is valid, reliable, and useful is possible to create remains unclear at this time.
Implementation Issues	
Developing Statistics and Measures Less the Problem	There are numerous public library statistics and measures currently being collected by state library agencies to describe networked services, use, and resources. Concerns about comparability, the burden of such collection, accurate and timely national reporting, and implementing such a system nation-wide may be more problematic that developing the statistics and performance measures
Coordinating the Development of Network Statistics and Performance Measures	The importance of capturing library network services usage data is an issue with which numerous national and international library professional organizations, standards development committees, researchers, library organizations, library consortia and coalitions, and consultants have been wrestling substantially in recent times. These efforts often cross-library types (e.g., academic, public), technology infrastructure and implementation, and other key factors. Each stakeholder realizes the importance of capturing electronic network usage data for a variety of reasons, and thus engages in efforts to develop network statistics and performance measures, definitions for those statistics and measures, and data collection techniques for those statistics and measures.
Scalability of Network Statistics and Performance Measures	The collection of national network statistics and performance measures implies that it is possible to collect network statistics and performance measure data atthe local library level and aggregate that data on a national basis. Preliminary data collection activities suggest that the scalability issue is complex and not easily resolved.
Implementation of Procedures	Any set of new networked statistics and performance measures will require a "roll-out" period that adequately educates and prepares libraries to collect the required data. This roll-out period will need to be coordinated by state library agencies and others, and it may take 1-2 years to complete *prior* to any actual data collection.
Rewards and Incentives	It is not clear if there are adequate rewards and incentives for state library and individual libraries to initiate a regime of collecting new networked statistics and performance measures given other demands on their time. There is some evidence that local libraries see the current system as completely unworkable, too time consuming, and providing useless data for them for local decision making.
Ability to Collect Network Statistics and Performance Measure Data	In order to attain national network statistics and performance measure data, it is necessary to collect the raw data at the local library outlet level. An issue raised in the study team's data collection activities is the ability of the library outlets to collect such data.
Leadership Issues	
Reliance on Key State Library Leaders	State library agencies that are "leaders" in the collection of statistics and performance measures for networked information services and resources should be rewarded and encouraged to experiment with such efforts. Other states are likely to follow these efforts as they evolve.
National Leadership	There is a sense that the current national organization for selecting, collecting, analyzing, and reporting public library statistics may not be appropriate for the collection of national network statistics and performance measures. Should new models be considered for this task that include non-government agencies or other types of government/private section/library consortia arrangements?

Table 2. Issues in Developing National Statistics and Performance Measures for the Networked Environment (cont'd).

Leadership Issues (cont'd)	
Issue	**Description**
Resources for the National Collection and Reporting Effort	There is a need to consider the degree to which the U.S. government adequately supports the national data collection and reporting process for public libraries. An analysis of the costs associated with the current data collection program may be useful to determine which organizations are paying for what types of expenses related to the national data collection and reporting programs.
Education Issues	
Re-Educating Local Community Leaders	Librarians have spent decades convincing local governing boards that circulation counts or reference transactions, etc. that go up annually are a "good thing." Now that these and traditional counts are stagnant or declining in many cases, librarians have to re-educate governing boards that web hits, electronic reference questions, full text down-loads, and other indicators are as or more important than the traditional measures.
Education and Buy-in for Network Statistics and Performance Measures	Although there appears to be substantial interest in the collection of network statistics and performance measures at the state library and national levels, there is mixed interest at the local library outlet and system level.

nation is to have useful data to plan for and extend the role of public libraries in the networked environment, *some* agreement on which data are to be collected will be needed.

Methodology Issues

New and Variant Methodologies

Network statistic and performance measure require researchers and professionals to consider the benefits and/or necessity of using traditional qualitative and quantitative methodologies (e.g., focus groups, interviews, surveys), adapting traditional methodologies (e.g., pop-up Web-based surveys), or creating new methodologies (e.g., Web-based transaction log analysis) to capture network usage data (see Table 3).

Those collecting network-based statistics and performance measures, depending on the collection technique(s) selected, need to:

- Know the capabilities and limitations of the selected methology(ies);
- Ensure that like network aspects are being compared across often separate services (e.g., database usage from one vendor versus another);
- Ensure the adherence to standard statistic definitions, operationalization, and collection techniques across libraries and states;
- Understand precisely what the data represent in terms of network usage; and
- Present the findings in a meaningful way to consumers of the data.

The above represent substantial methodological challenges for the networked environment.

Table 3. Methodologies for Measuring Electronic Network Services.

Qualitative

Technique	Function/Purpose
Case Sites	In-depth exploration of selected communities and target audiences in those communities, use of and involvement with the network. Use findings to inform broader quantitative data collection activities such as mail and electronic surveys.
Content Analysis	Gather various documentation and reports to review historical development and evolution of network-related activities.
Focus Groups	Explore identified key issue areas of network content, services, management, and performance. Use findings to inform broader quantitative data collection activities such as mail and electronic surveys.
Small Group and Individual Interviews	In-depth exploration of network content, services, management and performance with key project administrators and users. Assess the relationship between components of the network and future educational use and development of network resources. Use findings to inform broader quantitative data collection activities such as mail and electronic surveys.
Critical Path Analysis	In-depth exploration of user-based interactions with project-related components (e.g., training, workstation use, and searching). Use findings to uncover specific instance issues. Particularly appropriate for in-depth analysis of training and use issues.

Quantitative

Technique	Function/Purpose
Mail/Electronic Surveys	Further explore identified key issue areas of network content, services, management, and performance with broader project population. Test findings from qualitative data collection activities with broader network population.
Network Traffic Measures	Collect network/terminal traffic use statistics such as users, user access points, information and service content use, and network server and router load. Provides sense of network load, capacity, and what services are used with what frequency.
Web Log File Analysis	Measure Web-based services by the analysis of Web server log files. Provides sense of users and locations from which access the services, server traffic, type of technology users have, and errors made.

Data beyond the Control of Libraries and States

Libraries and states are engaging in substantial licensing agreements for Internet-based database access with vendors (e.g., OCLC, Ebsco, UMI, Gale/IAC). At present, libraries and state library agencies are dependent upon the vendors to provide them with a range of database usage statistics. Currently, the degree to which the database vendors respond to the library communities' need for various statistics (e.g., log-ons to a particular database, IP addresses of log-ons, time of day of log-on, and duration of the session or visit to a particular database) is mixed at best.

Based on a study in progress by the study team reviewing vendor database statistics and the site visits conducted, it is apparent that vendors provide reports to libraries and states that differ in their:

- Format, time frame, presentation, and delivery (e.g., some send paper only reports monthly, some provide online/real time access);
- Definitions of usage; and
- Reporting, with some vendors providing a wealth of usage data (e.g., searches, sessions, time of day, logins, IP domains) and others providing only bare usage statistics (e.g., sessions and searches).

Increasingly, however, libraries need to have summary statistics of networked database use that are controlled by vendors and not the library. This issue is not unique only to public libraries. All librarians will need to make known their data reporting needs to vendors better and agree among themselves as to the data needed; vendors will need to better listen and work with the library community to automate data collection and reporting in database software and standardize data reporting techniques.

Samples Rather than Populations

To promote timely and responsive statistics and performance measures more reliance on carefully developed samples rather than 100% population responses may be needed. Such may be needed at the local, state, and national levels. Currently, NCES strives to obtain 100% response rates before data will be analyzed and reported. The trade-off for obtaining 100% response from the population is an extended delay in reporting data.

For many librarians and policymakers, having data based on samples that produces relatively quick reporting (six months from data collection to data reporting) is well worth a small decrease in the accuracy of the data. Part of the issue here is having data and findings that are "good enough" for decision making at the national, state and local level as opposed to data that have high academic quality for in-depth assessment.

Move to Qualitative Data

To address a range of performance issues related to using networked information resources and services it may be necessary to increase the reliance on collecting, analyzing and reporting various qualitative data. Likert scales that assess user satisfaction with a particular networked service, for example, may be very useful to better describing perceived usefulness of a service such as interactive web-based reference service. The degree to which such approaches can then be compared across different libraries, however, is problematic.

Additional research is necessary to assess the degree to which statistics and performance measures based on qualitative techniques are useful for various stakeholder groups. At the local level, it is well-known that anecdotal information and other types of "human interest stories" can be quite powerful in supporting the use of networked library services. At the state and national level, however, such may not be true and the anecdotes may be difficult to aggregate into a "national" perspective. Work, however, in this area should continue.

Estimates of Network Services

All nationally collected and reported data related to libraries and services are best seen as estimates – even those that are currently being collected. The fact of the matter is that there are limited reliability and validity checks that can be established over the data collection process. There needs to be recognition that any of the statistics and performance measures likely to be proposed for the networked environment will also result in *estimates* and will have varying levels of accuracy depending on how they are collected and reported. Estimates, however, are better than having nothing. Estimates can still be used as input for decision-making and are likely to be "good enough" as opposed to having no data. Providing footnotes and explanations to the limitations of such data should be considered as an important component in any data reporting process and can reduce the misuse of interpreting such data.

Definitional Issues

Defining Networked Services

The definition that the study used for this term was:

> Network-based resources and services are those electronic information resources and/or services that users access at a public library or access via a public, regional, or statewide library telecommunications network. Examples of electronic network *resources* include: public, regional, or state library hosted or authored web sites or library or licensed databases (e.g., Infotrac, SearchBank, EbscoHost). Examples of electronic network *services* include: provision of access to networks via public access workstations or dial-in/remote access; network services such as e-mail, listservs, chat, online reference/assistance; and training in use of these resources and services.

While there is agreement that networked statistics and performance measures must have clear and easily understandable definitions, many of these terms are complex and may require detailed definitions with detailed examples. Some of these definitions may have to include arbitrary decisions as there are competing possible definitions – none of which may be compelling. Thus, in the short term it may be less important which definition of terms is used than that there is some national agreement to use a particular definition until there are compelling reasons to change it.

Rethinking "Population Served" and "Per Capita" Measures

In the networked environment, the "legal population served looses meaning because anyone from the around the word can access and obtain services off, for example, a library Website. Thus, traditional measures that index service provision or costs to legal population served (or some local geographical area) may be inappropriate. As an example, the performance measure "reference transactions per capita" can include electronic reference transactions that might originate from around the world. But in fact the determination of the "per capita" part of the measures is based on an estimate of legal population served – which may come from the state or another government unit. It is unclear how such "per capita" measures can be translated into the networked environment.

Issues Related to the Use of Networked Statistics and Performance Measures

Evolving Development of Statistics and Performance Measures

The process of developing network statistics and performance measures is evolutionary. As a result, the study team continues to refine network statistic and performance measure definitions, the statistics and measures of interest and use, and methodological issues regarding the collection and presentation of network statistics and measures based on the various data collection activities the study team undertakes. There may be a period of time where these definitions change over time because the ability to measure networked services and resources may also change over time. Thus, definitions that make sense today, may be more reliable or accurate once research methods and measurement techniques improve.

More importantly, however, is that there is a need to revisit the core statistics and measures, definitions, and data collection techniques periodically. Technology infrastructure and capabilities change rapidly and, as a result, there will be an impact on the types of statistics and measures of interest, ability to collect those statistics and measures, and the presentation and interpretation of those statistics and measures.

Implications for Longitudinal Aspects of Network Statistics and Performance Measures

The rapidly changing nature of information technology will have a substantial impact on the life cycle of the network statistics and performance measures developed through this study (as well as those efforts undertaken by others working in this area). It is very likely that it will not be possible to have longitudinal data describing networked information resources and services that extend beyond 3-5 years. The mindset of producing statistics that are meaningful over long periods of time (e.g., circulation per capita; attendance counts; reference transactions; etc.) may need to change.

For example, collecting data to describe the degree to which public libraries in the US are connected to the Internet was especially important in the early to mid-1990s. However, as that percentage approaches 90% (as it is expected to do early in the new century, its importance is considerable less. More important might be describe the type of connectivity and the types of services being provided by that connection. Five years from now, it may be less important to describe the type of public library connectivity if 90% or more have T-3 or better levels of connectivity. By then, some new type of statistic – not previously considered because of changes in technology and access – may be more appropriate to describe library networked services and resources.

The result is that the library community will need to adopt a different model for data collection activities. This model is one of:

- Rapid response and focused data collection activities;
- Multiple data collection techniques, including online and print surveys, interviews, focus groups, logs, etc.;
- Quick analysis and presentation of results; and
- Continually evolving data elements and measures.

Such a model requires a new philosophical approach by the library profession towards the collection of long-term library statistics as well as the development of new data collection mechanisms between libraries and the state library agency responsible for compiling and passing on library statistics to national data collection entities.

Comparability of Numbers Across Libraries and States

To what extent can these national statistics and performance measures be compared across libraries and states? The answer lies, at least in part, on having carefully developed procedures and definitions that facilitate libraries collecting data the same way and under similar conditions. The issue of comparability and accuracy of the data across different states and libraries is not a new issue. The results of the site visits, however, suggest that insuring accuracy or data so that such comparability can occur may be *more* challenging for networked services and resources than for traditional services currently being collected.

Reporting back to Libraries

Until the states and national agencies do a better job of analyzing and reporting back to individual libraries statistics that are timely and useful for decision-making, there will be limited commitment to collecting such data. Successful reporting back to individual libraries will require customized analyses, intended to assist them in local decision making, done in a very timely fashion.

A common complaint heard by the study team during the site visits was that much of the data they collected was not reported back to them in a manner in which they could use it for local decision making. Some interesting approaches, however, are evolving. Some states, such as Kentucky <http://www.kdla.state.ky.us/libserv/stats.htm>, are currently experimenting with interactive websites that allow local libraries to analyze the state database of statistics and print off their own reports and graphs. Some private sector firms such as Bibliostat <http://www.bibliostat.com/> are implementing systems that allow libraries to do real time comparisons and benchmarking against other "peer libraries." Additional work needs to be done in this area to promote ways in which local libraries can make better use of the data they collect.

Issues Related to Library Technology and Uses

Technology Infrastructure and Configuration

Based on the research conducted thus far by the study team, no two libraries have the same information technology infrastructure, configuration, or systems implementation. Moreover, while libraries may use similar applications and hardware, no two are implemented in the same manner. This creates a substantial challenge for the collection of the *same data* from libraries using similar (but different) technology in various configurations. Another implication is that the development for instructions to libraries about how best to collect networked data may require multiple approaches to accommodate differences in local technology infrastructure configuration.

At issue is not the development of and adherence to the definitions of the electronic statistics and performance measures. Rather, the key issue is being able to collect, given the differing configurations and implementations, the same data across the various implementations and technologies. It may be that libraries and state library agencies will need to undergo modification to be able to generate and capture some of the network statistics and performance measures recommended by this research effort.

My Technology, My Outlook

A library facility's infrastructure and use of technology leads to a local view of network statistics. That is, study participants base their need for electronic network statistics on their facility's use of and involvement with network resources and services. As such, it is often difficult for individual libraries to see the need for certain statistics and performance measures that do not *directly reflect* their facility's current implementation and use of various network services and resources. Generally, librarians want to collect networked data only if it makes sense for their particular situation and for their particular technology.

Data Collection Issues

Automated Data Collection

From both a Web-based environment as well as a vendor-supplied database environment, there is a need for networked services and resources to be described automatically and unobtrusively by the system itself rather than through overt data collection efforts on the part of state libraries and individual libraries. For example, there are a number of software programs that can track uses and services provided via the library's website. Libraries may also be able to write their own programs to track/monitor web and other types of uses. Many librarians commented that they simply do not have the time, expertise, or interest in collecting such data for the state or the national government unless the data collection process is automated and unobtrusive.

Working with Vendors

Related to the issue above is the need for the library community to be more forceful in detailing contract language that requires database vendors to be better able to supply specific types of statistical information from the use of these databases. Increasingly, the library community is dependent on statistics from vendors if such statistics are to be obtained. Progress could be made on this issue if lead libraries would agree amongst themselves as to the type and definition of the various statistics that should be provided by the vendors. The database vendors cannot be expected to provide customized and/or unique sets of statistics to each of their customers.

A complicating factor in working with vendors is that there are a number of initiatives that claim library representation with online database vendors. For example, the International Consortium of Library Consortia (ICOLC), Association of Research Libraries (ARL), Council on Library and Information Resources (CLIR), U.S. National Commission on Libraries and Information Science (NCLIS), to name a few, are working towards developing vendor statistics and reporting standards. Working with and coordinating among these efforts became a focus of this study. The extent to which continued collaboration among these efforts will be possible in the future is unclear.

Composite/Unit of Service Approach

Many libraries and state library agencies are looking for some type of single/composite measure that captures the *Units of Service* that a library provides, rather than a single count/statistics that focuses on a single measure of library services (e.g., circulation). Such an approach removes the reliance upon single service measures such as circulation as indicators of library service consumption. For example, some librarians recommended to the study team that a unit of service might be "networked services provided" which would include electronic reference requests, log-ins on the library's website, and downloads of full text articles from the library (or database provider's) server. The extent to which a composite measure that is valid, reliable, and useful is possible to create remains unclear at this time.

Statistics to Address Policy Issues

The statistics and performance measures needed from year to year to address state and national policy issues are likely to vary. A national statistical system needs to be "fleet footed" enough to be able to both anticipate and respond timely to such policy issues affecting library services. For example, a current debate in the U.S. is the role of libraries in supporting the development of universal service to the nation's residents. When the initial debates occurred in Congress regarding universal service issues (as described in the Telecommunications Act of 1996), the library community had very little data to address these issues and propose strategies for appropriate roles of public libraries to support the provisions of universal service in the new law.

The Burden of Data Collection at the Local Library

To reduce overall burdens of data collection in may be appropriate to consider collecting certain data to produce certain statistics and performance measures every other year or every third year, etc. In some instances a serious reduction in data currently being collected may be necessary if new networked statistics are to be collected. Many local public librarians report that the existing annual surveys administered by the state library agencies are "excessive" in time demands. Indeed, some state library agencies add hundreds of additional data elements to the annual survey beyond those required by the NCES.

Implementation Issues

Developing Statistics and Measures Less the Problem

The study team has identified numerous public library statistics and measures currently being collected by state library agencies that describe networked services, programs, use, and resources <http://www.ii.fsu.edu/Albany_IMLS_Webfiles/public_html/index.html>. The study confirmed that some states are also developing additional statistics and performance measures for statewide collection.

Concerns about data comparability, the burden of such collection efforts, ensuring accurate and timely national reporting, and implementing such a system nation-wide may be more problematic that developing and agreeing on the statistics and performance measures to be used as a basis for national data collection and reporting. A major issue encountered by the study team during the site visits was how best to *reduce* the potential list of statistics related to networked services and resources.

Coordinating the Development of Network Statistics and Performance Measures

The importance of capturing library network services usage data is an issue with which numerous national and international library professional organizations, standards development committees, researchers, library organizations, library consortia and coalitions, and consultants have been wrestling substantially in recent times. These efforts often cross-library types (e.g., academic, public), technology infrastructure and implementation, and other key factors. Each stakeholder realizes the importance of capturing electronic network usage data for a variety of reasons, and thus engages in efforts to develop network statistics and performance measures, definitions for those statistics and measures, and data collection techniques for those statistics and measures.

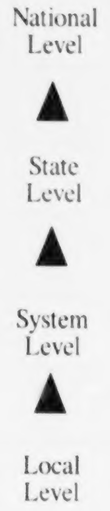
These efforts yield, unfortunately, often uncoordinated approaches to the development of statistics and performance measures, differing statistic and measure definitions, variations on elements for data collection that reflect local/organizational issues and context, and the adoption of different data collection techniques.

The study team continues to identify existing electronic network statistic and performance measurement efforts, and is attempting to coordinate efforts where possible for the purpose of developing standard statistics and performance measure definitions and data collection techniques. The extent to which these efforts can inform the development of ***national*** public library and statewide network statistics and performance measures remains unclear.

Scalability of Network Statistics and Performance Measures

The collection of national network statistics and performance measures implies that it is possible to collect network statistics and performance measure data at the local library level and aggregate that data to a state and national basis (see Figure 6). Preliminary data collection activities suggest that the scalability issue is complex and not easily resolved.

Figure 6. Levels of Collection and Aggregation for Statistics and Performance Measures.



For example, the data needs to be scalable in the sense that the data collected at the local library is important and useful for that library, for the state, and at a national level. If the local library believes that the data is not useful locally, librarians may not collect the data nor be committed to collecting it accurately. Scalable also implies that when the data from all the various local libraries and the 50 states are collated or aggregated, they are still useful and meaningful.

Implementation of Procedures

Any set of network statistics and performance measures will require a "roll-out" period that adequately educates and prepares libraries to collect the required data. This roll-out period will need to be coordinated by state library agencies and others, and it may take 1-2 years to complete *prior* to any actual data collection.

It has been suggested to the study team during the site visits that that *any* new procedures for data collection (including the introduction of new data elements) should first be pre-tested with collection instructions. After the pre-test, the revisions and changes should be confirmed as appropriate with selected representatives at state library agencies. Then the FSCS coordinators at the individual states should be briefed and trained. Finally, the local libraries would be briefed on the data collection process and be given a year to prepare.

Rewards and Incentives

It is not clear if there are adequate rewards and incentives for state library and individual libraries to initiate a regime of collecting new networked statistics and performance measures given other demands on their time. There is some evidence that local libraries see the current system as completely unworkable, too time consuming, and providing useless data for them for local decision making.

A key aspect of successfully implementing a national program to collect and report statistics describing networked activities and services will be also implementing a reward and incentive system for local libraries to *want* to contribute to the program. Additional thought will be necessary to identify a range of possible incentives and rewards that encourage local libraries to participate. The assumption that local libraries will continue to participate in the annual surveys that includes additional data collecting requirements related to networked services and resources without such incentives should be re-examined.

Ability to Collect Network Statistics and Performance Measure Data

In order to attain national network statistics and performance measure data, it is necessary to collect the raw data at the local library outlet level. An issue raised in the study team's data collection activities is the ability of the library outlets to collect such data. Indeed, branch library managers and library system directors expressed concern in the ability of their facilities to:

- Engage in rigorous data collection activities that require staff time and effort;
- Support data collection activities with staff and resources;

- Develop expertise in electronic network data collection activities; and
- Collect any other data than that generated by system activity logs.

Essentially, the primary source of data collection – the library outlet level – may not have the ability, resources, or expertise to engage in electronic network data collection activities.

Leadership Issues

Reliance on Key State Library Leaders

State library agencies that are "leaders" in the collection of statistics and performance measures for networked information services and resources should be rewarded and encouraged to experiment with such efforts. A number of states are already experimenting with the collection of such data. Some are using innovative techniques for collecting statewide data electronically. Still others are developing websites that allow for interactive use and analysis of the annual survey data. Other states, once made aware of these innovations, are likely to follow these efforts as they evolve.

National Leadership

There is a sense that the current national organization for selecting, collecting, analyzing, and reporting public library statistics may not be appropriate for the collection of national network statistics and performance measures. As mentioned earlier, the process for recommending and then implementing the collection of new data elements is cumbersome and time-consuming at best. The time lag between submission of data and the reporting of that data is excessive – sometimes two years or more.

The key organizations involved in this national data collection and reporting process currently are the U.S. National Center for Educational Statistics, the U.S. National Commission on Libraries and Information Science (NCLIS), the Institute on Museums and Library Services (IMLS), the state library agencies. New models and organizations (as well as the possible involvement of those that participate currently in the collection of library statistics) should be considered for this program that include non-government agencies, educational institutions, or other types of government, private sector/library consortia arrangements.

Resources for the National Data Collection and Reporting Effort

Another factor to consider is the degree to which the U.S. government adequately supports the national data collection and reporting process for public libraries. While it certainly is true that government agencies everywhere are finding budgets to be tight, an analysis of the costs associated with the current data collection program may be useful to determine what organizations are paying for what types of expenses related to the national data collection and reporting program.

Further, some thought should be given to any additional expenses that might be incurred by various organizations if the data collection and reporting process is to be expanded with the addition of a number of new data elements related to networked services and resources. It may be that some approaches for expanding the program to cover networked services and resources may be more cost-effective than others.

Education Issues

Re-Educating Local Community Leaders

Librarians have spent decades convincing local governing boards that circulation counts, attendance records, reference transactions, etc. that go up annually are a "good thing." Now that these and other traditional counts are stagnant or declining in many cases, librarians have to re-educate governing boards that web hits, electronic reference questions, full text down-loads, and other indicators are as or more important than the traditional measures.

The move to delivery of and access to a range of electronic services and resources via the networked environment by libraries in recent years has not been "counted" or adequately reported as part of the overall presentation of public library activities. Thus, to some extent, public libraries are inadequately representing and describing what it is they do in and for the local community. Local community leaders may not understand services delivery and use in a networked environment. In such cases, re-education will be more than explaining the use of different or augmented statistics to describe library services in this evolving networked environment.

Education and Buy-in for Network Statistics and Performance Measures

Although there appears to be substantial interest in the collection of network statistics and performance measures at the state library and national levels, there is mixed interest at the local library outlet and system level. Some librarians have yet to recognize the impact and implications arising from the move to delivery of information services in a networked environment – nor, the changing role of the library in this environment. There also is some limited appreciation of the usefulness and importance of having national data related to the public library in the networked environment to propose and debate various policy issues in Congress and the administration.

EVALUATING THE PROJECT AND PROJECT RESULTS

This section evaluates the extent to which the research study accomplished its goals and objectives. The study team engaged in a number of formative and summative evaluation processes through which to assess and validate the study's activities, findings, and recommendations.

Study Objectives

The overall goal of the study was to develop a core set of national statistics and performance measures that librarians, researchers, and policy makers can use to describe public library and library-based statewide network use of networked services and resources. The study had the following three objectives:

1. Identify and develop a descriptive list of national statistics and performance measures that describe public library network use to include definitions, methods of collection, and intent/purpose of the elements and performance measures;
2. Test and validate the statistics in a sample of public libraries in selected states with the assistance of selected state library agencies and public libraries; and
3. Produce a concise manual that describes the proposed national statistics, possible performance measures that can be computed from these data elements and statistics, the techniques through which to collect the data, and considerations for analyzing and presenting network usage data.

As such, the study set out to identify national network statistics and performance measures for public libraries, test and validate those statistics and performance measures, and produce a manual that described the statistics and measures and the means through which to collect data on those statistics and measures.

Identify and Develop a List of National Statistics and Performance Measures

The study team engaged in a number of activities to identify potential network statistics and performance measures, including (see Appendix C):

- Literature review of network statistical and performance measurement activities in the library and other literature;
- Focus groups and interviews with state library agency staff (including state data coordinators), public librarians, library association staff (e.g., Urban Libraries Council, Public Library Association), policy makers, library governing board members, and others; and
- Surveys with state library agency staff (including state data coordinators), public librarians, library association staff (e.g., Urban Libraries Council, Public Library Association), policy makers, library governing board members, and others regarding the utility, interest, and ability to collect suggested statistics and performance measures.

This extensive review and pre-testing process yielded a core set of statistics and performance measures, definitions, data collection methodologies, and reporting procedures for field-testing purposes.

Test and Validate Statistics

As described in the *Methodology* and *Study Activities* sections of this report, as well as Appendices D and E, the study team engaged in extensive testing and validation activities regarding the network statistics and performance measures. To summarize, the study team:

- Field-tested all statistics in at least two public library settings over a period of six months. During this time, field-test sites not only attempted to collect the statistics using the prescribed methodologies and techniques, but also provided suggestions and guidance as to modifications in the definition, methods of collection, and analysis and presentation of the statistics.
- Conducted a separate field-test of the online vendor database statistics using individual public libraries, a multi-type library consortia (North Carolina's NCLive), and Maryland's statewide network Sailor. Through these entities, the study team worked with a number of vendors to collect and report usage statistics for a one-month period for each of the entities.
- Validated the final statistics and performance measures through presentations, workshops, focus groups, interviews, and other activities upon completion of the field-test. Examples of these activities include:
  - Presentation at the FSCS data coordinators' annual training workshop in March 2000,
  - Coordination with the FSCS working group on statistics, and NCLIS, to begin the adoption process for selected network statistics into the annual public library collection process (still ongoing),
  - Presentations and focus groups with Maryland public library administrators (MAPLA) and directors at their spring and fall 2000 meetings,
  - Presentations and focus groups with the Illinois library directors at their annual meeting in August 2000,
  - Focus groups and interviews with librarians, vendors, policy makers, and others at ALA Midwinter 2000, the PLA conference in March 2000, and ALA Annual conference in July 2000,
  - Focus groups, interviews, and presentations with librarians and managers at the International Information Resources Management Association conference in May 2000,
  - Presentation and feedback from librarians at a regional library system in Wisconsin, September 2000,
  - Presentation, small group meetings, and feedback from librarians at the State Library of Florida annual Director's Conference, October 2000,
  - Presentation and dissemination at the Panhandle Library Access Network, Panama City, FL, October 2000,
  - Presentations, feedback, and dissemination to librarians and state library officials at the Pennsylvania Technology Conference, November 2000.

Together, these activities served to produce valid and reliable network statistics and performance measures. To the degree that these presentations and meetings occurred later in the project, they also contributed toward dissemination of project findings and results.

Network Statistics and Performance Manual

Once the study team produced a final set of tested and validated network statistics, the team focused on developing a manual to guide public librarians through the data collection process, use, analysis, and presentation of the statistics and performance measures. In particular, the study team created a manual that:

- Identified and defined a core set of network statistics and performance measures for public libraries;
- Introduced a number of additional statistics and performance measures for libraries to consider if appropriate to their particular management, decision making, or data needs situations;
- Described the methodologies through which to collect and report the statistics and performance measures;
- Suggested a number of supplemental data collection activities, including focus groups and interviews, for libraries to consider when trying to collect qualitative, anecdotal data regarding their network service and resource usage;
- Described issues and recommendations for libraries to consider when deciding which statistics and performance measure to use under various decision making or other circumstances;
- Suggested a number of data management strategies for libraries to consider when collecting usage statistics in general and network resource and service usage statistics in particular; and
- Provided tutorials as to how to integrate online vendor database statistics across different vendors into a single database for analysis purposes.

The American Library Association published the manual: Bertot, J.C., McClure, C.R., and Ryan, J. (2001). *Statistics and performance measures for public library networked services*. Chicago, IL: American Library Association. ISBN: 0-8389-0796-2.

Dissemination Activities

As identified throughout this report, the study team conducted a number of project dissemination activities that included presentations, workshops, panel discussions, and the production of a network statistics and performance measure manual. The study team also maintained a project website (initially http://www.albany.edu/~imlsstat/, now located at http://www.ii.fsu.edu/Albany_IMLS_Webfiles/public_html/) on which the study team published all project-related documents, reports, etc. The study team continues to maintain the website and will build upon that website as the team begins to work on the development of a national network statistic and performance measure data collection model. The study team is also presenting an all-day workshop, in conjunction with ALA Midwinter (January 14, 2001) in

Washington, D.C. to providing training and dissemination on how to use, administer, and report the statistics and performance measures outlined in the manual.

FUTURE DIRECTIONS

The importance of the funding IMLS provided to conduct this research project was significant, as it:

- Lifted the research efforts in this area into a national forum;
- Underscored the need for a standardized approach to public library network statistics and performance measures;
- Identified the need to incorporate network statistics and performance measures into existing public library data collection efforts so as to reflect accurately the services public libraries provide; and
- Laid the foundation for an evolving dialog in the library community as to how best to capture and present its involvement with network services and resources provision, uses, and usage.

The efforts in which the study team engaged, though substantial, indicate that these are only the beginning steps of a long-term research effort in which statistics and performance measures will evolve over time to meet the data collection and management needs of public libraries, state library agencies, and policy making entities. In short, there is more work to be done.

Building a National Data Collection System

With continued support from IMLS, the study team will pursue a means through which to develop a national data collection system for public library network statistics and performance measures. This effort builds upon the foundation laid through this initial research project that established a core set of statistics and measures.

Research by the authors – as well as numerous formal and informal interviews, focus groups, and discussions with library leaders, researchers, and policy makers – suggests that there may be numerous approaches to the development of a national network statistics and performance measure collection, reporting, and analysis system. These include:

- *Extending the current National Center for Education Statistics (NCES), National Commission on Libraries and Information Science (NCLIS), state library agency, and public library Federal State Cooperative System (FSCS) collaborative approach for annual public library data collection.* In this model, public library data on selected statistics are passed from public libraries to state library agencies up to NCES for compilation, analysis, and reporting. All 50 states plus the District of Columbia and U.S. Territories participate in the process.

  At present, there are approximately 50 data elements collected and reported through the FSCS process (e.g., operating budgets, FTEs, circulation). It is necessary to propose new elements through an administrative procedure, and element adoption requires the vote of at least 26 state data coordinators (personnel located in state library agencies) with a three-year phase-in on inclusion by all 50 states, Washington, D.C., and U.S. Territories. The adopted elements then go into the following year's survey form for collection. The time from element vote to adoption to collection can be as long as three years.

Over the last several years, the FSCS group undertook several efforts to adopt a variety of network statistics. All have failed to get the necessary votes for adoption.

- *Developing a lead states and libraries approach to data collection and reporting.* For a variety of reasons, it may not be feasible for all public libraries and state library agencies in the nation to simultaneously adopt and report data on a set of network statistics and performance measures. However, research by the authors demonstrates that there are a number of states (20+) that indicate their willingness and/or desire to collect at least a core set of network statistics and performance measures from the public libraries within their states. The same research shows that, while a state library agency or a number of public libraries within a state may not be willing or able to collect network statistics, lead public libraries within states find it imperative to collect such data for a variety of decision making, management, and reporting purposes. In this model, lead public libraries and state library agencies adopt, collect data, analyze data, and report data on a core set of network statistics and performance measures. The lead state library agencies and public libraries also serve as an incubator for developing, defining, and reporting new network statistics and performance measures.
- *Creating an ongoing sampling design to generate national estimates.* This model employs a sampling approach for a variety of data collection activities to use with public libraries, state library agencies, and library network consortia. The intent of this approach is to develop a sample that would enable the generation of national estimates of core set of network statistics and performance measures from public library, state library agency, and library network consortia. Such a model would permit the targeting of network statistics appropriate to the level of data collection – library, state library agency, library consortia – as well a framework for modifying or creating new statistics and performance measures on an as needed basis. It would be possible to engage in the data collection process on a regular (e.g., annual, biannual) and/or ad hoc (e.g., as necessary) basis.
- *Adopting a combination approach to network statistic and performance measure data collection.* The above data collection models are not mutually exclusive. Rather, it is possible to combine aspects of the FSCS, lead state/library, and sampling approaches to collect, analyze, and report public library network statistics and performance measures so as to provide nationally aggregated network statistical data.

A key aspect of the future research project is to determine which model or aspects of the above models – including models and/or approaches not yet identified – are appropriate under what circumstances for the development, definition, collection, analysis, and reporting of national public library network statistics and performance measures.

While it is not possible at this time to determine which model, or aspects of the various models, is most appropriate for collecting national network statistics and performance measures, it is possible to identify some key characteristics that the national approach should have based on current research by the authors. At a minimum, these characteristics include:

- *Creating a fast response approach to the development, collection, analysis, and reporting of network statistics and performance measures.* A key criticism of the FSCS process is the time lag between the development of data elements and the eventual reporting of those elements. For a variety of reasons, it can take four years under the current FSCS process from development to reporting of statistics (to be fair, the FSCS group undertook changes in its bylaws recently to expedite the element adoption and reporting process). By the time the NCES releases the public library data reports, the data are often outdated. This is particularly problematic in the networked environment in which any network statistics and performance measures will likely remain relevant for two-three years.
- *Fostering an environment of constant change.* Gone are the days of statistics and performance measures that last for decades. The networked environment is such that change in technologies and the implementation of those technologies is rapid. Thus, the statistics and performance measures that capture network data will necessarily undergo constant modification. It is imperative, therefore, that the model for national library network statistics and measures foster an environment of flexibility, change, and creativity in the creation, collection, and reporting of statistical data.
- *Implementing a reasonably burden free data collection and reporting process for public libraries, state library agencies, and library consortia.* It is clear that data reporting requirements imposed on public libraries are arduous. It is also clear, however, that network usage statistics are increasingly important to professionals, researchers, and policy makers. Thus, it is necessary to develop a data collection and reporting system that provides maximum benefit for minimal effort.
- *Working with non-library partners to gain access to library network data.* Increasingly, key network usage data is out of the public library, state library, and library consortia domain. Examples include online database usage, Internet service provider (ISP), and telecommunications carrier (e.g., bandwidth consumption) data. It is critical to the measurement of library network services that the national data collection activities develop reporting partnerships with, minimally, the online database vendor, ISP, and telecommunications carrier communities.

Undoubtedly, there are other characteristics necessary for a national public library network statistics and performance measure data collection system, but the above are key.

Collaboration with Key Research Efforts

The study team continues to work with a number of research efforts in the area of network statistics and performance measures, including those of NCLIS, ARL, ICOLC, and the National Information Standards Organization (NISO). It is essential for this collaboration to occur if there is to be any hope of generating, where possible, standardized statistics, definitions, and data collection techniques.

As part of the national statistics model development process the study team will pursue – to the extent possible – collaborative efforts so as not to duplicate works in progress.

Evolving Statistics and Performance Measures

Clearly, the statistics and performance measures will need to evolve over time to reflect changes in library operating environments as well as changes in technology. As such, the researchers, and others, will need to facilitate the process through which statistics and performance measures for the networked environment undergo periodic review for necessary modification and/or whole cloth development. The national model described above will need to incorporate a review process that addresses this issue.

Moving towards Outcomes Measures

As identified in the IMLS report *Perspectives on Outcome Based Evaluation for Libraries and Museums* (IMLS, 1999), outcomes relate to benefits and/or changes that individuals, groups, or institutions accrue after having been exposed to a particular program or effort. The statistics and performance measures developed through this study and described in this report would produce outcomes at the public library institution level. It is, however, premature to determine the impacts, benefits, or other outcomes that public libraries would gain until public libraries collect, analyze, and present the statistics and performance measures on a regular basis. Possible outcome measures for public libraries would be:

- Increased staff funding for network service and resource-related library functions;
- Additional public access workstations, thus reducing the "per capita" ratios;
- Increased reference activity with the availability of online reference services;
- Increased collections usage with the availability of online serials and other database material; and
- Increased visitors to the library, with the inclusion of virtual visitors to the walk-in count.

It is important to note that these outcomes (and other possible outcomes) will require a period of collection at that library level prior to their ability to be measured on a regular basis.

The current network statistics and measures focus on institutional services. This is largely due to the nature of developing *national* statistics and performance measures – there are nearly 9,000 public library systems throughout the United States, and each is different in terms of size, technology infrastructure, and other key variables related to network statistics and performance measures. Given the complexity of the public library community, the first step in outcomes measures focused on the institution. There is, however, a need to consider outcomes measures at the individual user or group users of library services. Such efforts will undoubtedly follow once libraries have a greater familiarity with network service and resources measurement activities.

CONCLUSION

Over the course of the project a significant range of accomplishments have occurred that have moved the profession forward regarding statistics, performance measures, assessment techniques, and national approaches for collecting and reporting public library data in a networked environment. These accomplishments occurred not only because of the funding of the project from the Institute for Museum and Library Services, but also because of the extensive number of people in the library/information science field that *wanted* to be part of these accomplishments.

The study team continues to be very pleased and gratified with the level of interest and support for this project and our efforts to design a national data collection and reporting strategy for public library networked services and resources in the future (IMLS funded project 2000-2001). Despite this gratification, there is considerable work yet to be done in this area. To some degree, the technical work on defining and field testing statistics and measures may be easier than the political and coordinating work among various stakeholder groups.

As work on this project suggests, there is a very large range of stakeholder groups that all have differing points of view as to which statistics and performance measures should be collected and reported. These groups include local libraries, regional consortia, state libraries and state consortia. Also interested are national groups such as IMLS, ICOLC, NISO, the FSCS, and NCLIS. And of course there are a range of private sector database vendors that are quite interested in these efforts to develop statistics and performance measures for the networked environment.

Continued success in this area of research will depend on the ability of these various stakeholder groups to coordinate their development work and to reach agreement not only about specific statistics and performance measures but how best to present and report those data. The study team will continue working with these various groups, it will continue to disseminate the results from the project reported here through a number of state, local, and national conferences, and it will continue to develop, refine, and test additional statistics and performance measures related to the networked environment.

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APPENDIX A – SAMPLE DATA COLLECTION TOOLS

Network Measures Questionnaire

Name: ______________________________ E-mail: ____________________
Title: ____
Phone: ___________________________ Fax: ______________________
Address: ____

1) Please rate usefulness to you of the existing data collected about your library's networked services/resources?

1	2	3	4	5
Not at all Useful		Useful		Very Useful

2) Please rate the usefulness to you of the existing data being collected on the state's public libraries' networked services/resources?

1	2	3	4	5
Not at all Useful		Useful		Very Useful

3) Please rate the need to expand or revise existing efforts to collect and use data on public libraries' networked information services/resources.

1	2	3	4	5
No Need				A Top Priority

4) Data on public library network resources and services is useful to me if (be as specific as possible):

5) Think of three important recurring occasions over the past year when you used or could have used data about one or more of the state's public libraries' network resources and services?

What data did you need?	**When did you need the data?**	**Why did you need the data?**

6) Are there 2-3 key public library opinion leaders in the state knowledgeable about public library network resources and services measures who we should interview via telephone or e-mail?

Name	E-mail	Phone

The study team will compile a set of recommended potential network measures upon completion of the site visits. The study team intends to:

- Assess site visit participant's preferences for these proposed network measures via an e-mail survey;
- Conduct tests for problems in collecting and presenting the resulting recommended measures; and,
- Produce and test a field manual that introduces the recommended measures, their efficient collection, interpretation, and effective use.

In order to complete these tasks the study team would like your help as follows.

7) Would you agree to participate in an e-mail survey of preferences for specific potential network measures at a future date? ___Yes ___No

8) Would you agree to participate in testing the collection and presentation of a draft set of network measures at a future date? ___Yes ___No

9) Would you agree to review a draft copy of a national network statistics users' manual for us at a future date?
___Yes ___No **(Continued on the next page)**

10) Please provide us with your recommendations and comments on the following performance measures.

Measure	Definition	Recommend Yes/No?	Comments
Public access library workstations per capita	The number of public access Internet workstations in the library divided by the population of the library's legal service area. Further refinements: Workstations connected at 56k or less v. workstations connected at greater than 56k; Graphical/text terminals, Filtered/non-filtered workstations.		
Electronic reference transactions per capita	The number of reference transactions conducted via email or via a library's Website divided by the population of the library's legal service area.		
Response time to electronic reference transactions	The average time (as measured in some unit such as days or hours) that users receive answers to electronic reference questions.		
Web visits per month	A *visit* is a user who visited a Web site, regardless of the number of pages, or elements he or she viewed. If a user looked at sixteen pages and fifty-four graphics while at a Web site, that user registered one visit on the Web server. A visit is usually determined by a user's IP address, which can be misleading due to Internet Service Providers (ISP's and Firewall's or Proxy Servers). Thus, this measure is an *estimate* of the visits.		
% of annual budget for information technology expenditures	All expenditures for information technology (example list of expenditures to be developed) divided by the total annual expenditures of the library.		
% of annual materials budget for electronic resources	All expenditures for electronic resources (example list to be developed) divided by the total annual materials expenditures.		
Public Internet training per month	The total hours per month that library staff have provided Internet training in a formal or pre-scheduled session.		
Overall public access workstation use	The % per month (or some measure of time e.g., week or day) that public access Internet workstations are in use divided by number of hours of library operation during that time period.		
Saturation of network use/resources	The percentage of network resource use (e.g., number of modems in modem in use; telnet/remote logins; bandwidth consumption) per measure of time (as measured in some increment of time such as hour, day, week, or month).		

11) Please make additional comments here:

Developing Public Library Statistics for the Networked Environment
FSCS Coordinator, Knowledgeable Staff, & Project Liaison Data Collection Form

What Network Measures Do You Need

Focus for a moment on your need for network measures in order to do your job better what are the recurring events, recurring demands from significant groups, recurring purposes, etc.

State Library Itself

1) Name three important recurring occasions over the past year when you used or could have used data about the State Library's network resources and services?

When did you need the data?	What data did you need?	Why did you need the data?

The State's Public Libraries

2) Name three important recurring occasions over the past year when you used or could have used data about one or more of the state's public libraries' network resources and services?

When did you need the data?	What data did you need?	Why did you need the data?

The Nation's Public Libraries

3) Name three important recurring occasions over the past year when you used or could have used data about one or more of the nation's public libraries' network resources and services (other than your own library)?

When did you need the data?	What data did you need?	Why did you need the data?

4) Why is national data, e.g., data about other public libraries and other state libraries useful to you? How do you, would you, use this data?

5) What network measures does the State Library collect at present? Interviewer check to see if we have all the data requested in the data call. Probe: Which measures do you find particularly useful, if any? Why?

6) What network resources and services lend themselves to measurement and data collection activities?

Resource or Service	Measure

7) Summarizing, data on public library network resources and services is useful to you if (be as specific as possible):

Probe: Helps politically: to justify present activities, seek new funds
- Improves management: To plan better, public library scanning function
- By type of audience: legislature, governor, public library directors, general public
- By recurring event: budget
- Other:

Assessment of Potential Network Measures

8) Refer to the briefing paper distributed prior to the study team's visit. Interviewer use the Assessment of Potential Network Measures chart. For each potential measure identified: Is the measure feasible, who would use, is it useful, problems and issues you foresee?

9) Are there network measures that should be dropped or added to this proposed list? Interviewer use blank chart pages? Refer back to the initial needs identified by person being interviewed.

Techniques for Statewide Data Collection, Analysis, and Reporting

10) Who will the State Library use to collect, interpret, and present network measures? Does this represent a commitment of new staff, a re-deployment of existing staff (something is no longer done), or no change in staffing?

11) Can the feasible and useful network measures identified be produced by vendors or database providers?

Proposed Network Measure	Who Does/Could Collect?	How?

12) (a) What steps do you take currently to insure the reliability and validity of data collection activities? (b) What future steps are feasible?

13) What are the current steps you take to collect network measures? Interviewer, it might be useful to suggest to the person interviewed start with a particular month and go through the year.

Step	Problem or Issue

14) How can the burden of data collection of network measures be reduced?

15) How should the network measures that you and others identified as both feasible to collect and usable be presented to you and others for maximum impact and use?

Measure	How Used?	How presented?

16) Can groupings of network measures be developed for target audiences, for example, network measures for rural, suburban, urban public libraries? Good idea, bad? Suggested ways of grouping?

17) Can you readily connect to the Internet via a workstation at your desktop? ___Yes ___No
18) Do you use spread sheet or statistical packages? ___ Excel ___SPSS ___SAS
___Other spreadsheet (Which one:) ________________ ____ Other statistical package______________
19) Does the State Library collect statistics from you using the Internet?___Yes ___No

Coordination Across Levels

20) Can you suggest mechanisms to better coordinate federal, state, and local collection of network measures?

Developing Public Library Statistics for the Networked Environment
Public Library Data Collection Form

What Network Measures Do You Need

Focus for a moment on your need for network measures in order to do your job better what are the recurring events, recurring demands from significant groups, recurring purposes, etc.

Your Public Library (System) Itself

1) Name three important recurring occasions over the past year when you used or could have used data about your library's network resources and services?

When did you need the data?	What data did you need?	Why did you need the data?

The State's Public Libraries

2) Name three important recurring occasions over the past year when you used or could have used data about one or more of the state's public libraries' network resources and services?

When did you need the data?	What data did you need?	Why did you need the data?

The Nation's Public Libraries

3) Name three important recurring occasions over the past year when you used or could have used data about one or more of the nation's public libraries' network resources and services (other than your own library)?

When did you need the data?	What data did you need?	Why did you need the data?

4) Why is national data, e.g., data about public libraries in other states and national figures useful to you? How do you, would you, use this data?

5) What network measures does your library collect at present? Interviewer ask for copies. Probe: Which measures do you find particularly useful, if any? Why?

6) What network resources and services lend themselves to measurement and data collection activities?

Resource or Service	Measure

7) Summarizing, data on public library network resources and services is useful to you if (be as specific as possible):
Wait then probe: Helps politically: to justify present activities, seek new funds
Improves management: To plan better, public library scanning function
By type of audience: legislature, governor, public library directors, general public
By recurring event: budget
Other:

Assessment of Potential Network Measures

8) Refer to the briefing paper distributed prior to the study team's visit. Interviewer use the Assessment of Potential Network Measures chart. For each potential measure identified: Is the measure feasible, who would use, is it useful, problems and issues you foresee?

9) Are there network measures that should be dropped or added to this proposed list? Interviewer use blank chart pages? Refer back to the initial needs identified by person being interviewed.

Techniques for Data Collection, Analysis, and Reporting

10) Who will your library use to collect, interpret, and present network measures? Does this represent a commitment of new staff, a re-deployment of existing staff (something is no longer done), or no change in staffing?

11) Can the feasible and useful network measures identified be produced by vendors or database providers?

Proposed Network Measure	Who Does/Could Collect?	How?

12) (a) What steps do you take currently to insure the reliability and validity of data collection activities? (b) What future steps are feasible?

13) What are the current steps you take to collect network measures? Interviewer, it might be useful to suggest to the person interviewed start with a particular month and go through the year.

Step	Problem or Issue

14) How can the burden of data collection of network measures be reduced?

15) How should the network measures that you and others identified as both feasible to collect and usable be presented to you and others for maximum impact and use?

Measure	How Used?	How presented?

16) Can groupings of network measures be developed for target audiences, for example, network measures for rural, suburban, urban public libraries? Good idea, bad? Suggested ways of grouping?

17) Can you readily connect to the Internet via a workstation at your desktop? ___Yes ___No
18) Do you use spread sheet or statistical packages? ___ Excel ___SPSS ___SAS
___Other spreadsheet (Which one:) ________________ ____ Other statistical package______________
19) Does the State Library collect statistics from you using the Internet?___Yes ___No

Coordination Across Levels

20) Can you suggest mechanisms to better coordinate federal, state, and local collection of network measures?

Assessment of Potential Network Measures Chart Category: **Collections**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
CD-ROMs	Definition: CD-ROM refers to compact discs that do not solely contain audio information and are available for public use. • Count the number of physical units. • Count the number of unique titles. • Count the number of customers who can simultaneously use each title at once.				
Electronic Subscription Services	Definition: This element includes both full-text and index (for example, EBSCO, Gale, Wilson) electronic subscriptions that are available for public use. • Count the number of discrete, vendor-based systems subscribed to • Count the number of titles contained within each subscription • Count the number of customers who can simultaneously use each vendor subscription				

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Assessment of Potential Network Measures Chart Category: **Collections**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Software Packages	Definition: Software packages means software such as Microsoft Word, Microsoft Excel, or any other software that allows for the performance of similar tasks and that are available for public use. • Count the number of physical units. • Count the number of unique titles. • Count the number of customers who can simultaneously use each title at once.				

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Assessment of Potential Network Measures Chart Category: **Computers & Networking or Equipment and Access**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Computers Available to the Public	• Count the number of computers, in total, available • Count the number of dumb terminals available • Count the number of Mac and PC computers available • Count the number of computers which provide access to the Internet • Count the number of computers which are connected to CD-ROM resources • Count the number of computers which provide access to software packages • Count the number of computers which provide access to electronic subscription services • Count the number of computers which provide access to the OPAC				

Assessment of Potential Network Measures Chart Category: **Computers & Networking or Equipment and Access**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Internet Access Available to the Public	• Report the type of Internet access available (none, dial-up, 56K, T1, ISDN, other) • Report the type of Internet services available (none; e-mail; newsgroup; graphical web-browsing; text-based web-browsing; FTP; telnet; login; other)				
Printers Available to the Public	• Count the total number of printers available to the public • Report the ratio of the number of computers which have access to printers to the number of printers available to the public				

Assessment of Potential Network Measures Chart Category: **Computers & Networking or Equipment and Access**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Library Home Page Services	• Report the type of information and services provided by the library's web site: • no web site; • description of library services; • access to library's catalog or to consortium/regional catalogs; • access to subscription databases restricted to library patrons only; • access to subscription databases not restricted to library patrons only; • a selection of links; • capability for public to e-mail reference questions to staff)				

Assessment of Potential Network Measures Chart Category: **Expenditures or How Much Does It Cost?**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Computer-Related Hardware Available to the Public Expenditures	• Report expenditures made for computer-related hardware that is made available to the public. This can include: • Expenditures for computers, printers, modems, or other associated hardware designed to provide access to electronic services to the public.				

Assessment of Potential Network Measures Chart Category: **Expenditures or How Much Does It Cost?**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Electronic Access Expenditures	• Report all operating expenditures from the library budget associated with access to electronic materials and services. Include expenditures for equipment used to run information service products when it cannot be separated from the price of the product. • Report expenditures for services provided by national, regional, and local bibliographic utilities, networks, consortia, and commercial services. Report all fees and usage costs associated with such services as electronic subscription services or electronic document delivery.				

Assessment of Potential Network Measures Chart Category: **Expenditures or How Much Does It Cost?**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Electronic Format Expenditures	• Report operating expenditures for materials in electronic format that are considered part of the collection, whether purchased or leased, such as • CD-ROMs (using the definition in the Collections section); • magnetic tapes, and • Magnetic disks that are designed to be processed by a computer or similar machine. • Report expenditures for computer software for patron use here.				

Assessment of Potential Network Measures Chart Category: **Expenditures or How Much Does It Cost?**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Maintenance of Computer-Related Hardware Available to the Public Expenditures	• Report expenditures for maintenance of computers, printers, or other computer-related hardware designed to provide access to electronic services to the public.				
Telecommunications Expenditures	• Report all expenditures relating to telecommunications, excluding voice communications, and including Internet service provider expenditures.				

Assessment of Potential Network Measures Chart Category: **How Are the Library's Electronic Resources Being Used?**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Accesses to the Library's Web Pages	• Count the number of accesses to the library's top 5 web pages during a representative one-week period. The top 5 web pages is determined by analyzing the logs of all the pages and ranking the pages in order of accesses.				
Electronic Subscription Services Use by the Public	• Count the number of searches performed on computers available to the public within the library during a representative one-week period. • Count the number of searches performed on computers remote to the library during a representative one-week period.				

Assessment of Potential Network Measures Chart Category: **How Are the Library's Electronic Resources Being Used?**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
OPAC Use by the Public	• Count the number of OPAC searches performed on computers available to the public within the library during a representative one-week period. • Count the number of OPAC searches performed on computers remote to the library during a representative one-week period.				

Assessment of Potential Network Measures Chart Category: **Performance Measures**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Public access library workstations per capita	Definition: The number of public access Internet workstations in the library divided by the population of the library's legal service area. NOTE: could be further refined as workstations connected at 56k or less versus workstations connected at greater than 56k.				
Electronic reference transactions per capita	Definition: The number of reference transactions conducted via email or via a library's Website divided by the population of the library's legal service area.				

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Assessment of Potential Network Measures Chart Category: **Performance Measures**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Web visits per month	Definition: A *visit* is a user who visited a Web site, regardless of the number of pages, or elements he or she viewed. If a user looked at sixteen pages and fifty-four graphics while at a Web site, that user registered one visit on the Web server. A visit is usually determined by a user's IP address, which can be misleading due to Internet Service Providers (ISP's and Firewall's or Proxy Servers). Thus, this measure is an *estimate* of the visits to the Website.				

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Assessment of Potential Network Measures Chart Category: **Performance Measures**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Percentage of annual budget for Information Technology expenditures	Definition: All expenditures for information technology (example list of such expenditures to be developed) divided by the total annual expenditures of the library.				
Percentage of annual materials budget for electronic resources.	Definition: All expenditures for electronic resources (example list of such expenditures to be developed) divided by the total annual materials expenditures.				

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Assessment of Potential Network Measures Chart Category: **Performance Measures**

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues
Public Internet training per month.	Definition: The total hours per month that library staff have provided Internet training in a formal or pre-scheduled session.				

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Assessment of Potential Network Measures Chart Category:

Data Element	**Definition**	**Feasibility?**	**Who Needs?**	**Usability?**	**Problems & Issues**

Assessment of Potential Network Measures Chart Category:

Data Element	**Definition**	**Feasibility?**	**Who Needs?**	**Usability?**	**Problems & Issues**

Assessment of Potential Network Measures Chart Category:

Data Element	Definition	Feasibility?	Who Needs?	Usability?	Problems & Issues

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Assessment of Potential Network Measures Chart Category:

Data Element	**Definition**	**Feasibility?**	**Who Needs?**	**Usability?**	**Problems & Issues**

APPENDIX B – STUDY ADVISORY COMMITTEE

Developing National Public Library Statistics And Performance Measures for the Networked Environment

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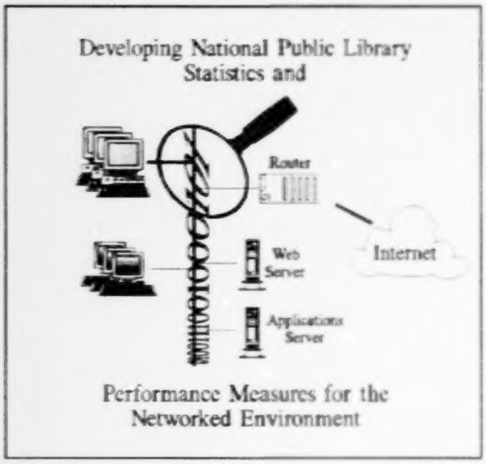
APPENDIX C – PRELIMINARY NETWORK STATISTICS AND PERFORMANCE MEASURES

Preliminary Network Statistics	
	Collections
CD-ROMs	Definition: CD-ROM refers to compact discs that do not solely contain audio information and are available for public use. • Count the number of physical units • Count the number of unique titles • Count the number of titles contained within each subscription • Count the number of customers who can simultaneously use each title at once
Electronic subscription services	Definition: This element includes both full-text and index (e.g., EBSCO, Gale, Wilson) electronic subscriptions that are available for public use. • Count the number of discrete, vendor-based systems subscriptions • Count the number of titles contained within each subscription • Count the number of customers who can simultaneously use each vendor subscription
Software packages	Definition: Software packages means software such as Microsoft Word, Microsoft Excel, or any other software that allows for the performance of similar tasks and that are available for public use. • Count the number of physical units • Count the number of unique titles • Count the number of customers who can simultaneously use each title at once
	Equipment and Access
Computers available to the public	• Count the number of computers, in total, available • Count the number of dumb terminals available • Count the number of Mac and PC computers available • Count the number of computers which provide access to the Internet • Count the number of computers which are connected to CD-ROM resources • Count the number of computers which provide access to software packages • Count the number of computers which provide access to electronic subscription services • Count the number of computers which provide access to the OPAC
Internet access available to the public	• Report the type of Internet access available (none, dial-up, 56K, T1, ISDN, other) • Report the type of Internet services available (none; e-mail; newsgroup; graphical web-browsing; text-based web-browsing; FTP; telnet; login; other)
Library home page services	• Report the type of information and services provided by the library's web site: ➢ no web site; ➢ description of library services; ➢ access to library's catalog or to consortium/regional catalogs; ➢ access to subscription databases restricted to library patrons only; ➢ access to subscription databases not restricted to library patrons only; ➢ a selection of links; ➢ capability for public to e-mail reference questions to staff)
Printers available to the public	• Count the total number of printers available to the public • Report the ratio of the number of computers which have access to printers to the number of printers available to the public

Preliminary Network Statistics (cont'd)	
Costs	
Computer-Related Hardware Available to the Public Expenditures	• Report expenditures made for computer-related hardware that is made available to the public. This can include: ➢ Expenditures for computers, printers, modems, or other associated hardware designed to provide access to electronic services to the public
Electronic Access Expenditures	• Report all operating expenditures from the library budget associated with access to electronic materials and services. Include expenditures for equipment used to run information service products when it cannot be separated from the price of the product • Report expenditures for services provided by national, regional, and local bibliographic utilities, networks, consortia, and commercial services • Report all fees and usage costs associated with such services as electronic subscription services or electronic document delivery.
Electronic Format Expenditures	• Report operating expenditures for materials in electronic format that are considered part of the collection, whether purchased or leased, such as ➢ CD-ROMs (using the definition in the Collections section); ➢ magnetic tapes; and ➢ Magnetic disks that are designed to be processed by a computer or similar machine • Report expenditures for computer software for patron use here
Maintenance of Computer-Related Hardware Available to the Public Expenditures	• Report expenditures for maintenance of computers, printers, or other computer-related hardware designed to provide access to electronic services to the public
Telecommunications Expenditures	• Report all expenditures relating to telecommunications, excluding voice communications, and including Internet service provider expenditures
Use	
Accesses to the library's Web pages	• Count the number of accesses to the library's top 5 web pages during a representative one-week period. The top 5 web pages is determined by analyzing the logs of all the pages and ranking the pages in order of accesses
Electronic subscription services use by the public	• Count the number of searches performed on computers available to the public within the library during a representative one-week period • Count the number of searches performed on computers remote to the library during a representative one-week period
OPAC use by the public	• Count the number of OPAC searches performed on computers available to the public within the library during a representative one-week period • Count the number of OPAC searches performed on computers remote to the library during a representative one-week period

Preliminary Performance Measures	
Public access library workstations per capita	Definition: The number of public access Internet workstations in the library divided by the population of the library's legal service area. Further refinements: • Workstations connected at 56k or less versus workstations connected at greater than 56k; • Graphical/text terminals; • Filtered/non-filtered workstations.
Electronic reference transactions per capita	Definition: The number of reference transactions conducted via email or via a library's Website divided by the population of the library's legal service area.
Response time to electronic reference transactions	Definition: The average time (as measured in some unit such as days or hours) that users receive answers to electronic reference questions.
Web visits per month	Definition: A *visit* is a user who visited a Web site, regardless of the number of pages, or elements he or she viewed. If a user looked at sixteen pages and fifty-four graphics while at a Web site, that user registered one visit on the Web server. A visit is usually determined by a user's IP address, which can be misleading due to Internet Service Providers (ISP's and Firewall's or Proxy Servers). Thus, this measure is an *estimate* of the visits to the Website.
Percentage of annual budget for information technology expenditures	Definition: All expenditures for information technology (example list of such expenditures to be developed) divided by the total annual expenditures of the library.
Percentage of annual materials budget for electronic resources	Definition: All expenditures for electronic resources (example list of such expenditures to be developed) divided by the total annual materials expenditures.
Public Internet training per month	Definition: The total hours per month that library staff have provided Internet training in a formal or pre-scheduled session.
Overall public access workstation use	Definition. The percentage per month (or some measure of time such as week or day) that public access Internet workstations are in use divided by the number of hours of library operation during that time period.
Saturation of network use/resources	Definition: The percentage of network resource use (e.g., number of modems in modem in use; telnet/remote logins; bandwidth consumption) per measure of time (as measured in some increment of time such as hour, day, week, or month).

APPENDIX D – GENERAL FIELD TEST PRELIMINARY NETWORK STATISTICS AND PERFORMANCE MEASURES


Developing National Public Library Statistics and
Router
Web Server
Internet
Applications Server
Performance Measures for the Networked Environment

DEVELOPING STATISTICS AND PERFORMANCE MEASURES FOR THE NETWORKED ENVIRONMENT:

FIELD TEST METHODOLOGY

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INTRODUCTION

The study team has engaged in numerous data collection activities to develop national public library statistics and performance measures for the networked environment between January 1999 and September 1999. These activities include (see http://www.albany.edu/~imlsstat/ for detailed descriptions and findings from the study's research activities):

- Establishing a project advisory committee comprised of library professionals, administrators, executives, data collection and statistics coordinators, and vendors;
- Reviewing extensively electronic network statistics and performance measure literature;
- Reviewing extensively available network statistic and performance measure data collection efforts at the state library agency level (for all states that publish their data on the Web, not just the six state study participants);
- Conducting in-depth surveys with the six participating state library agencies regarding state library electronic network statistics and performance measure data collection activities and online database vendor-supplied statistics;
- Developing preliminary network statistics and performance measures based on the data collection efforts;
- Pre-testing the preliminary network statistics and performance measures with the six state study participants. The pre-test also served to inform the study team about the research approach and data collection efforts for the remaining five state study participants;
- Conducting focus groups and individual interviews with public and state library leaders regarding the proposed statistics and performance measures;
- Presenting current findings from the project at national, state, and local conferences and meetings;
- Revising the statistics and performance measures based on the site visits and study data collection activities; and
- Pre-testing the revised statistics and performance measures with the Federal-State Cooperative System Working Group on Statistics meeting in Washington, D.C. in September 1999.

Based on the data collection activities above, the study team developed a final list of statistics and performance measures to field test (see Tables 1 and 2).

This document outlines the network statistics field test methodology and timeline. Upon completion of the field test, the study team will begin the to develop and test a network statistic and performance measure manual for use by librarians, researchers, and policy makers.

Table 1. Field Test Data Elements/Statistics for the Networked Environment (as of September 1999).

Data Element/Statistic	Definition	Core/ Optional	Proposed Method of Collection	FSCS
Public Access Workstations				
# Public access workstations	Count of the number of public access graphical workstations that connect to the Internet.	Core	Total count	Refinement of element #51
Public access workstation usage	Measure of public access workstation usage through count of users.	Optional	Sampling at a period to be determined such as 2 weeks every quarter.	
Maximum speed of public access Internet workstations	Indication of the maximum speed of public Internet access, e.g., 56kbps, ISDN, T1.	Core	Identify fastest public access connection speed.	
Databases				
# Unique electronic titles	Count of the number of unique online database titles available at the library. Refinements include full-text versus abstracted titles.	Optional	Total count	
# Electronic network sessions (adapted from ICOLC, http://www.library.yale.edu/consortia/webstats.html)	Overall count of the number of sessions (logins) initiated to the online databases. Refinements include breakdowns by title, time of day, IP address)	Unsure – field test	Total count of sessions	
# Electronic network queries/searches (adapted from ICOLC, http://www.library.yale.edu/consortia/webstats.html)	Overall count of the number of searches conducted in the library's online databases. Subsequent activities by users (e.g., browsing, printing) are not considered part of the search process. Refinements include breakdowns by title, time of day, IP address).	Unsure – field test	Total count of searches	
# Electronic network views (adapted from ICOLC, http://www.library.yale.edu/consortia/webstats.html)	Overall count of the number of online database content views (e.g., abstracts, full-text articles). Refinements include breaking down the views by user action – printing, e-mailing, saving to disk – and type of document (e.g., PDF, text, image, video)	Unsure – field test	Total count of views	
Electronic material expenditures	Total expenditures for online electronic material subscription expenditures (Internet-based subscription services). These may include one-time start-up costs as well as recurring costs.	Core	Total expenditures for online electronic materials	Refinement of Element #44

Table 1. Field Test Data Elements/Statistics for the Networked Environment (as of September 1999). Cont'd.

Electronic Services

Data Element/Statistic	Definition	Core/ Optional	Proposed Method of Collection	FSCS
# Electronic reference transactions	Count of the number of reference questions/ requests received electronically (e.g., via e-mail). Note: While not all libraries provide this service, site visits show the need for such a measure to capture the increase over time to show a proportional increase. This statistic has funding implications.	Core	Separate count of e-mail conducted reference transactions	Refinement of element #38
Virtual Visits				
# Virtual visits	A *visit* is a user who visits a Web site regardless of the number of pages or elements viewed. If a user looked at 16 pages and 54 graphic images while at a Web site, that user registers one visit on the Web server. Due to various Web server issues, this measure is an *estimate* of the visits to the Website. [Remote logins as well: count of number of remote logins (sessions) to non-Web-based library resources such as OPACS]	Core	Will need a standardized log tracker/ software to capture such data consistently. Also, may require changes in configuration at the local level to ensure the same data is collected and analyzed. This requires testing.	
Training				
# Users trained	Count of the number of users trained in structured and informal technology training sessions conducted by the library. Structured means a course with a designed curriculum intended to demonstrate the use of a technology such as the Web, Internet searching, personal computing, etc. Informal includes contacts with users by library staff intended to demonstrate the use of library workstations, aspects of the applications available on those workstations, etc.	Core	Debate over # users or contact hours	
# Staff trained per year	The total number of staff trained through formal/ structured technology training during the calendar year (or fiscal year). Refinements: types of training sessions attended.	Core	Total count of staff trained per year	

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Table 2. Field Test Performance Measures for the Networked Environment (as of September 1999).

Performance Measure	Definition
Public access library workstations per capita Alternative: per registered borrower; per thousand	The number of public access workstations in the library divided by the population of the library's legal service area. Refinements: connected, non-connected, but provide software, combination; connected at 56k or less v. workstations connected at greater than 56k; graphical/text terminals; filtered/non-filtered workstations; stand alone/networked.
Electronic reference transactions per reference transactions Alternative: per registered borrower	The number of reference transactions conducted via email or via a library's Website divided by the total number of reference transactions.
Virtual visits per month Alternative: 2-week period each quarter	A *visit* is a user who visited a Web site regardless of the number of pages or elements viewed. If a user looked at 16 pages and 54 graphic images while at a Web site, that user registers one visit on the Web server. A visit is usually determined by a user's IP address, which can be misleading due to Internet Service Providers (ISP's and Firewall's or Proxy Servers). Thus, this measure is an *estimate* of the visits. Refinements: internal library user versus remote user.
Virtual visits as percentage of total visits	A percentage of virtual visits to total library visits (walk-ins).
Database visits per month Alternative: 2-week period each quarter	A *visit* is a user who initiates a session using an online database regardless of the number of searches, views, or other actions undertaken during that session. Using PC, network, or vendor-supplied statistics, libraries would compile an aggregate of database visits on a monthly basis. Would also count remote logins (e.g., Telnet sessions) to library services such as OPACs. Refinements: # searches, views.
% of annual operating budget for electronic resources	All expenditures for electronic resources (example list to be developed) divided by the total annual operating expenditures.
Public technology training per month Alternative: 2-week period each quarter	The total number of users per month that library staff have provided technology training in a formal or informal session.
Staff training per month Alternative: 2-week period each quarter	The total number of staff per month that provided formal training in network technologies or applications. Could be by other library staff or other training staff.

METHODOLOGY

The site visits to the six participating states of Delaware, Maryland, Michigan, North Carolina, Pennsylvania, and Utah demonstrated that no one state collects, maintains, or disseminates its public library statistics in the same manner. Moreover, each state, and the public libraries within those states, has a substantially different information technology infrastructure and implementation of networked services and resources. For example:

- Maryland has a statewide network (Sailor) through which it provides access to networked information resources (http://www.sailor.lib.md.us/);
- Delaware has a state-library provided Web site (DelAWARE) through which it provides access to networked information resources (http://www.lib.de.us/).
- Pennsylvania does not have a statewide network. However, the state recently entered into a statewide licensing agreement with online database vendors to provide its Power PA service;
- North Carolina has a statewide consortial arrangement, NC Live, in which state library, public libraries, and public and private universities participate. NC Live provides access to numerous online databases (http://www.nclive.org/);
- Michigan engages in online Web-based public library data collection activities; and
- Utah recently contracted with Bibliostat, a software product produced by Management Dynamics that specializes in the collection and analysis of public library data, to collect and maintain Utah public library statistics (http://www.bibliostat.com/).

As such, the study team determined that no one research approach would be appropriate for the for the field test. Rather, the study team determined that a methodology that embraced the differences and unique aspects of the state public library networked service and resource configurations would better inform the field-testing of the statistics.

Goals of the Field Test

The goals of the field test are to:

- Finalize the definitions of the statistics and performance measures;
- Test various data collection and reporting methods;
- Work with online database vendors to develop a standardized set of statistics, reporting techniques, and data provision across vendors;
- Determine a final core set of network statistics and performance measures; and
- Identify issues and make recommendations for the collection of network statistics.

The primary focus of the field test will be on the statistics, as the statistics form the basis for the performance measures. The study team considers it critical, therefore, to concentrate on validating the network statistics.

Field-Testing In-library Statistics

While somewhat of an oversimplification, it is possible to divide the network statistics into two broad categories of in-library statistics and external statistics. In-library statistics are data that are largely under the direct control of the library and include (see Table 3)

- **Public access workstations**. Count of the number of public Internet access workstations, workstation usage, and maximum speed of Internet connection;
- **Databases**. Total expenditures for online electronic material;
- **Electronic services**. Count of the number of electronic reference transactions;
- **Virtual visits**. Website access or remote login count; and
- **Training**. Count of the number of users trained and the number of staff trained per year.

Most of the field test participants will focus on data collection for the above statistics.

Table 3. Proposed In-Library Statistics for Field-Testing.

Data Element/ Statistic	Definition	Core/ Optional	Proposed Method of Collection	Proposed State(s) to Collect Information
Public Access Workstations				
# Public access workstations	Count of the number of public access graphical workstations that connect to the Internet.	Core	Total count	Delaware Maryland Pennsylvania Utah
Public access workstation usage	Measure of public access workstation usage through count of users.	Optional	Sampling at a period to be determined such as 2 weeks every quarter.	Delaware Maryland Pennsylvania Utah
Maximum speed of public access Internet workstations	Indication of the maximum speed of public Internet access, e.g., 56kbps, ISDN, T1.	Core	Identify fastest public access connection speed.	Delaware Maryland Pennsylvania Utah
Databases				
Electronic material expenditures	Total expenditures for online electronic material subscription expenditures (Internet-based subscription services). These may include one-time start-up costs as well as recurring costs.	Core	Total expenditures for online electronic materials	
Electronic Services				
# Electronic reference transactions	Count of the number of reference questions/ requests received electronically (e.g., via e-mail). Note: While not all libraries provide this service, site visits show the need for such a measure to capture the increase over time to show a proportional increase.	Core	Separate count of e-mail conducted reference transactions	Delaware Maryland Pennsylvania Utah

Table 3. Proposed In-Library Statistics for Field-Testing. (Cont'd).				
Virtual Visits				
Data Element/ Statistic	**Definition**	**Core/ Optional**	**Proposed Method of Collection**	**Proposed State(s) to Collect Information**
# Virtual visits	A visit is a user who visits a Web site regardless of the number of pages or elements viewed. If a user looked at 16 pages and 54 graphic images while at a Web site, that user registers one visit on the Web server. Due to various Web server issues, this measure is an estimate of the visits to the Website. [Remote logins as well: count of number of remote logins (sessions) to non-Web-based library resources such as OPACS].	Core	Will need a standardized log tracker/ software to capture such data consistently. Also, may require changes in configuration at the local level to ensure the same data is collected and analyzed. This requires testing.	• Maryland • Pennsylvania • Utah
Training				
# Users trained	Count of the number of users trained in structured and informal technology training sessions conducted by the library. Structured means a course with a designed curriculum intended to demonstrate the use of a technology such as the Web, Internet searching, personal computing, etc. Informal includes contacts with users by library staff intended to demonstrate the use of library workstations, aspects of the applications available on those workstations, etc.	Core	Debate over # users or contact hours	• Delaware • Maryland • Pennsylvania • Utah

The study team will use multiple methodologies, data collection techniques, and approaches during field test. The differences in data collection activities will take advantage of the unique state public library data collection activities, IT configurations, and types of network services provision and resources available within each of the six field test states.

Delaware – The State Library Agency Data Collection Model

Delaware provides access to a variety of online services through the state library-run DelAWARE Web site (http://www.lib.de.us/). Residents of Delaware can gain access to the Internet and Internet-based resources offered through DelAWARE from public access workstations located in public libraries as well remotely via the Web. A distinguishing factor to the DelAWARE service is that users must enter their library bar codes in order to: 1) Access the Internet from a public library public access workstation, and 2) Access the online vendor databases.

For the field test, the study team envisions a collaborative data collection process between the state library agency and one public library. Because the state library agency provides numerous network support services to the public libraries in the state, the state library agency is in an excellent position to act as a network statistic data collection and dissemination entity. In this model, the state library agency would:

- Act as the data collection agent for public library network statistics;
- Collect and compile network statistic data from the public libraries in the state. These data include the public access workstation data, electronic services data, and training data; and
- Provide virtual visit and database data, as the managing agency for DelAWARE.

Since the study team will assess the Database statistics with North Carolina and Maryland, the state library agency would not be asked to provide that data for the field test.

The participating public library would provide the state library agency with:

- Public access workstation data;
- Electronic services (electronic reference transactions) data; and
- Training data.

In this field test model, therefore, the state library agency will act both as the provider of data for various key statistics as well as the collection and dissemination point for public library network statistic data in general.

Additional possibilities, due to the barcode entry system, include breaking down barcode information by library system and remote v. internal access to databases and networked services. This would provide substantial use and user-based information.

Maryland – Public Library and Statewide Network Model

Maryland provides the study team with the opportunity to collect all the network statistics developed by the project (see the below *External Library Statistics* section for a further discussion of the Maryland field test). For the field test, the study team intends to work with:

- Two public libraries that will collect public access workstation, electronic services, virtual visit (if applicable), and training data (likely to be Baltimore County and Anne Arundel County public libraries); and
- Sailor Operations Center to collect virtual visit data for Sailor.

This will provide a testing of all the proposed in-library network statistics.

The study team will establish a field test liaison within each public library and the Sailor Operations Center (SOC). These liaisons will work with the study team and the state library project coordinator to:

- Act as a single point of contact within SOC and the libraries;
- Coordinate the in-library field test;

- Provide the study team and project coordinator with updates as to the progress and issues encountered during the field test;
- Work with library staff to develop and coordinate a data collection and entry process for the collected statistics; and
- Facilitate any necessary post field test follow-up.

This approach provides a process through which the state library, participating libraries and SOC, and the study team are in continual contact and can address quickly field test issues.

Michigan – Online Web-based Data Collection Model

The Michigan state library offers its public libraries the ability to file electronically annual public library data via the Web (http://envoy.libofmich.lib.mi.us/). State library staff developed the electronic filing service to facilitate the data entry and analysis processes for public library statistics collected annually.

For the field test, the study team seeks to:

- Work with at least one public library in the state to collect public access workstation, electronic services, virtual visit (if applicable), and training data; and
- Work with the state library to modify the existing Web-based data entry form for the network statistics so that the participating public library can enter the data electronically via the Web.

In this approach, the state library provides an online data entry mechanism for the public library community.

The study team will establish a field test liaison within the public library and state library. The public library liaison will work with the study team and the state library project coordinator to:

- Act as a single point of contact within the library;
- Coordinate the in-library field test;
- Provide the study team and project coordinator with updates as to the progress and issues encountered during the field test;
- Enter the library network statistics data into the Web-based form; and
- Facilitate any necessary post field test follow-up.

The state library liaison will:

- Assist in modifying the existing online data entry forms to accommodate the electronic network statistics;
- Inform the project coordinator and study team of issues encountered during the field test that affect the data entry process;
- Provide the study team with the final data set from the library field test in an ASCII delimited file for analysis purposes; and

- Assist the study team during any necessary post field test follow-up.

This process will facilitate the in-library field test as well as the Web-based data entry system.

Pennsylvania – Distributed Model

For Pennsylvania, the field test will involve a rural and an urban public library. In both cases, the libraries will collect all the network statistics – public access workstation, electronic services, virtual visit (if applicable), and training data – save the online database statistics.

It is necessary to establish a field test liaison within each public library who will work with the study team and state library project coordinator. The public library liaison will:

- Act as a single point of contact within the library;
- Coordinate the in-library field test;
- Provide the study team and project coordinator with updates as to the progress and issues encountered during the field test;
- Work with library staff, the study team, and the project coordinator to develop and coordinate a data collection and entry process for the collected statistics; and
- Facilitate any necessary post field test follow-up.

This approach will create an important coordinated data collection process given the distributed nature of public library data collection in the state.

It is important to note that the state library has and continues to develop a statewide licensing agreement for online database services for Pennsylvania public libraries called Power PA. This service is still in its development stages. The study team will monitor the progress of the project throughout the field test period and may incorporate various aspects of the service into the field test.

Utah – Commercial Data Entry Model

Utah recently signed an agreement with Management Dynamics, Inc., the producer of the Bibliostat software (http://www.bibliostat.com/), to collect and analyze Utah's public library statistics. It is worth noting that many other state libraries also have contracts with Management Dynamics for public library data analysis and other services. Also, the study team has met with Management Dynamics staff at various times throughout the project to review the software and other products under development.

For the Utah field test, the study team intends to:

- Work with at least one public library in the state to collect public access workstation, electronic services, virtual visit (if applicable), and training data (likely Salt Lake City Public Library). There is a need to establish a public library liaison who will
    - Act as a single point of contact within the library,
    - Coordinate the in-library field test,

  - ○ Provide the study team and project coordinator with updates as to the progress and issues encountered during the field test, and
  - ○ Facilitate any necessary post field test follow-up;
- Work with the state library and Management Dynamics to adapt the Bibliostat software for the network statistics so that the participating public library can enter the data electronically through Bibliostat; and
- Work with the state library and Management Dynamics to promote the development of a networked/Web-based version of the data entry software so that future data collection can occur via the Web.

It may also be necessary to establish a state library liaison in addition to the project coordinator to facilitate the necessary Bibliostat data entry modifications.

This approach would field test a commercial/third party solution to the collection, analysis, and dissemination of public library statistics.

Field-Testing External Statistics

Libraries are not able to collect an important type of data on the usage of their electronic services and resources on their own. In particular, libraries do not have control over the usage data of their online database subscription services. Rather, the database vendors collect, maintain, and disseminate that data. Examples statistics include (see Table 4):

- **Databases**. Count of the number of unique online database titles, a count of the number of sessions, queries/searches, and views.

It will be necessary for the study team and field test participants to work with the online database vendor community to gain access to the above types of data. This portion of the project builds upon study team data collection activities performed previously to assess what information the vendor community could provide about electronic network resources usage (see http://www.albany.edu/~imlsstat/vendor.pdf). All six of the project websites subscribe to a networked licensed database, however, North Carolina and Maryland together provide the study team with an opportunity to review all four of the vendors (Ebsco, IAC/Gale, OCLC, UMI) selected in the initial review.

North Carolina's networked database(s) are available through a statewide consortial agreement between the state library, public libraries, and public and private universities called NC Live (see http://www.nclive.org/). Maryland's networked database(s) are available through their statewide network, SAILOR (see http://www.sailor.lib.md.us/). The study team considers NC Live and SAILOR to provide an efficient forum through which to test the proposed database statistics with the four licensed database vendors.

Table 4: Proposed External Library Statistics for Field-Testing.

Databases				
Data Element/ Statistic	*Definition*	*Core/ Optional*	**Proposed Method of Collection**	**Proposed State(s) to Collect Information**

# Unique electronic titles	Count of the number of unique online database titles available at the library. Refinements include full-text versus abstracted titles.	Optional	Total count	• North Carolina • Maryland
# Electronic network sessions (adapted from ICOLC, http://www.library.yale.edu/consortia/webstats.html)	Overall count of the number of sessions (logins) initiated to the online databases. Refinements include breakdowns by title, time of day, IP address).	Unsure – field test	Total count of sessions	• North Carolina • Maryland
# Electronic network queries/searches (adapted from ICOLC, http://www.library.yale.edu/consortia/webstats.html)	Overall count of the number of searches conducted in the library's online databases. Subsequent activities by users (e.g., browsing, printing) are not considered part of the search process. Refinements include breakdowns by title, time of day, IP address).	Unsure – field test	Total count of searches	• North Carolina • Maryland
# Electronic network views (adapted from ICOLC, http://www.library.yale.edu/consortia/webstats.html)	Overall count of the number of online database content views (e.g., abstracts, full-text articles). Refinements include breaking down the views by user action – printing, e-mailing, saving to disk – and type of document (e.g., PDF, text, image, video)	Unsure – field test	Total count of views	• North Carolina • Maryland

The study team will work with the project coordinators' for Maryland and North Carolina to:

- Request their participation during this phase of the project;
- Explain what is expected of them during this phase;
- Establish communication between the vendor contact person and the study team; and
- Provide regular feedback to the study team regarding the progression of the field-testing.

The project coordinators in both states agreed to test the proposed database statistics with their particular licensed database vendor(s).

North Carolina – Online Database Consortial Model

North Carolina, through a consortial agreement between the state library, public libraries, and public and private universities, developed NC Live (http://www.nclive.org/). NC Live provides access to a number of vendor-provided databases to North Carolina public library users as well as the research and higher education communities. Due to the robust nature of NC Live's online vendors agreements, the study team proposes to focus on the database statistics in North Carolina (see the previously discussed *Vendor Methodology* section). In particular, the study team intends to:

- Contact the vendors through NC Live and state library management structures and this study to explain the nature of the project, the desired data elements, data collection activities, and other relevant information concerning the interaction between the study team, NC Live, the state library, and the vendors;
- Work collaboratively with the NC Live staff, state library staff, and vendor staff to get database usage data reported to the study team for analysis purposes;

- Test the types of data reported, the way in which the data are reported (e.g., via the Web, electronically via e-mail), and the format of the provided data (e.g., standard format across vendors for comparative analysis purposes);
- Work with the vendors to provide data breakdowns such as by IP address;
- Determine the types of breakdowns desired/most useful to the database licensee; and
- Determine the issues encountered during the field test phase -- e.g., difficulty of providing statistics from the vendors' perspective, or quality/utility of the data from the perspective of NC Live.

Doing this would permit a strong focus on vendor statistics, thus identifying key issues concerning the availability, collection, analysis, and dissemination of online database vendor statistics.

Maryland – Public Library and Statewide Network Model

In addition to field-testing the in-library statistics with two Maryland public libraries and Sailor, the study team also intends to work with the state library to collect Gale/IAC Infotrac database usage data – a service provided via the Sailor network. The study team will:

- Contact Gale/IAC through state library and Sailor Operations Center (SOC) management structures and this study to explain the nature of the project, the desired data elements, data collection activities, and other relevant information;
- Work collaboratively with SOC staff, state library staff, and vendor staff to get database usage data reported to the study team for analysis purposes;
- Test the types of data reported, the way in which the data are reported (e.g., via the Web, electronically via e-mail), and the format of the provided data (e.g., standard format across vendors for comparative analysis purposes);
- Work with the vendors to provide data breakdowns such as by IP address;
- Determine the types of breakdowns desired/most useful to the database licensee; and
- Determine the issues encountered during the field test phase -- e.g., difficulty of providing statistics from the vendors' perspective, or quality/utility of the data from the perspective of Gale/IAC.

This approach will provide the study team with useful information regarding the vendor issues in providing a variety of database usage data in a number for formats.

Collecting the Proposed Statistics

The study team is asking each licensed database vendor to attempt to collect the three statistics: number of electronic sessions, number of electronic queries/searches; and number of network views. Based upon the first vendor analysis conducted by the study team, some of the licensed database vendors are already collecting the proposed statistics. However, the licensed database vendors' statistic definitions do not always coincide with those developed by the study team – and others such as the International Coalition of Library Consortia (ICOLC) -- through the various project data collection activities. As such, the study team will ask licensed database vendors to:

- Collect the statistics as defined by the study team (and the ICOLC);
- Provide the methodology behind collecting the statistics;
- Include the statistical refinements (see Table 3) where applicable; and
- Tell the study team where the statistics are available (vendor website, faxed, emailed to subscriber).

Each vendor will be asked to provide the data as defined by the statistics for a two week period (or another time period that is easiest for the vendors) to coincide with the two week in-library data collection phase of the field test. During this time, the study team expects to be in contact with the project coordinators in Maryland and North Carolina, the management teams for the networked resources in each state, and the licensed database vendors. By having an open forum for communication, the intent is to identify and resolve key data collection, definitional, and other issues.

Issues/Difficulties Encountered During Field-Testing

The study team is aware that there are a number of issues that will arise during the field-testing. One critical concern for the study team is the willingness of the vendors to participate in the field study process. The study team has identified a number of factors that affect a vendor's willingness to participate in the field test, including:

- Licensed database vendor(s) statistic(s) already match what the study team proposed;
- Study team's proposed statistic definitions are difficult to collect;
- Licensed database vendor(s) want their statistic(s) to remain unique; and
- Licensed database vendor does not want to participate in the field-testing.

The study team will work with the vendors, project liaisons, and online database management teams in the field test sites to gain vendor support for the project to the extent possible.

FIELD TEST TIMELINE

The study team anticipates conducting the field test for two weeks during the October 15 through November 15, 1999 timeframe. It is likely that the actual data collection activities would occur between November 1 and November 15, 1999. This would provide the field test participants with one month to finalize the arrangements necessary for the field tests.

At the end of the two-week period, the study team will conduct follow-up interviews and discussions as necessary to clarify issues that arose during the field test.

MANAGEMENT OF THE FIELD TEST

The study team will work directly with field test participants and the state project liaisons prior to, during, and after the field test. It is anticipated that members of the study team will have direct responsibility for certain states:

- John Bertot/Colleen Ostiguy – Maryland, North Carolina, and Pennsylvania; and
- Joe Ryan/Chuck McClure – Delaware, Michigan, and Utah.

This should facilitate communication and issue resolution throughout the field test period.

CONCLUDING COMMENTS

It is important to note that this is the first field test of its kind for collecting public library network-based statistics. Thus, there will undoubtedly be unforeseen issues encountered during the field test period. It is the hope of the study team that the tailored approach to each participating state will minimize problems during the field test period in terms of data collection. It is not possible, however, to predict with precision what will happen during the field test.

It is important to maintain a focus on the purpose of the field test: to test the network statistics – definitions, operationalization, data collection process, level of effort required, reporting of the data, and analysis of the data. Feedback from the field test participants on these aspects of the network statistics will provide all of us with extremely useful information as to the types of network statistics to collect and the issues involved with their collection.

The study team appreciates the willingness of the study participants to test the statistics and engage in experimentation throughout the data collection process.

APPENDIX D.1 – FSCS DATA ELEMENT DEFINITIONS

Data Element 38 – Reference Transactions

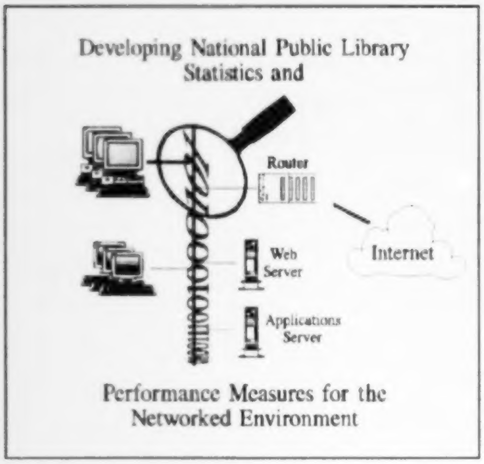
A reference transaction is an information contact which involves the knowledge, use, recommendations, interpretation, or instruction in the use of one or more information sources by a member of the library staff. It includes information and referral services. Information sources include printed and non-printed materials, machine-readable databases, catalogs, and other holdings records, and, through communication or referral, other libraries and institutions and people inside and outside the library. The request may come in person, by phone, by fax, mail, or by electronic format from an adult, a young adult, or a child.

Data Element 44 – Operating Expenditures for Library Materials in Electronic Format

Report operating expenditures for materials considered part of the collection, whether purchased or leased, such as CD-ROMs, magnetic tapes, and magnetic discs, that are designed to be processed by a computer or similar machine. Examples are U.S. Census data tapes, locally-mounted databases, serials, and reference tools. Include operating expenditures for equipment when the cost is inseparably bundled into the price of the information service product. Exclude operating expenditures for library system software and microcomputer software used only by the library staff.

Data Element 51 – Number of Internet Terminals Used by General Public

Number of computer terminals (PC, 'dumb terminal', etc.) used by general public in the library that are used to connect to the Internet (text only, graphical, etc.).


Developing National Public Library Statistics and
Router
Web Server
Internet
Applications Server
Performance Measures for the Networked Environment

DEVELOPING STATISTICS AND PERFORMANCE MEASURES FOR THE NETWORKED ENVIRONMENT:

FIELD TEST TASKING AND PROCEDURES

December 8, 1999

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STEP-BY-STEP FIELD TEST PROCEDURES

Thank you for agreeing to participate in the network measures field test. This document covers what the study team would like you to do. First some basics:

- **Purpose**: Earlier work by the study team, with your help, identified a group of network measures that may be useful to public libraries. During the field test we would like to develop unambiguous definitions for these measures, clear and standardized collection procedures, and identify potential uses of the resulting data. The study team will compile this information into a field manual of network measures.

- **What each library will do**: Each library participating in the field test has been assigned a small subset of the network measures to test. The library will receive (below) test definitions and data collection procedures for each measure assigned. The local library will implement these procedures documenting the step-by-step process used, how long it took, and problems and issues that may result. Data should be collected for a two week period. The library will also consider ways that it might use the data collected. The library will then submit the data collected and a summary of procedures used, problems and issues uncovered (if any), and potential uses for the data collected to the project's web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html> by February 1, 2000.

- **Field Test Dates**: The library may collect data between January 1, 2000 and January 31, 2000. We would like you to collect data for a minimum of two weeks. The report on your experience is to be submitted to the projects web site by February 1, 2000.

- **Key Contact**: There are always unforeseen problems, large and small, that crop up in any field test. When they do, please contact the project coordinator, Joe Ryan <jryan@mailbox.syr.edu> (315) 475-3630.

The object of the field test is to discover the potential problems and issues associated with these network measures along with the procedures and solutions so that the general public library community will have access to the best possible, pre-tested, network measures. The study team will use the results of the field test when preparing a field manual of network measures. Your library's input into this process is essential to the study team. So once again, thank you for participating. The next section offers some general instructions for participating in the field test. This section is followed by the specific data elements the study team would like your library to collect including definitions and procedures.

General Instructions

1) Pick a project liaison/coordinator: It may be useful to designate someone on staff to coordinate local data collection, interact where necessary with Joe Ryan the project coordinator, collect the data, prepare associated reporting and commentary, and input the results to the project's web site.

2) View the process with a constructively critical eye: Keep the big picture in mind: what would you as the local librarian in charge of collecting this data want to know in advance so that the data are collected efficiently and used effectively. Please don't hesitate, or wait for permission, to tell the study team anything that will improve the manual they write to accompany these measures.

3) Determine the data collection test period: Most of the measures being tested require that you collect data over a two-week period of time. Note that you can collect data any time January 1, 2000 and January 31, 2000. How you determine the collection period and why will be of interest to the study team. The field manual may well recommend that certain measures be collected using sample periods rather than over an entire year. What advice would you offer a library when selecting a sample period for any specific measure?

4) Develop local data collection procedures: Identify the local, step-by-step, procedures necessary to collect the network measures assigned. Who is going to do what, when, why? Prepare a written, step-by-step plan for collecting this data element, follow the format:

Data element:
Task Staff Member (Identify by job title) Hours (in quarter hour increments)

Add the time taken on each task as it is completed. Report the procedures to the study team using the project web site. The study team is also interested in obtaining any work forms or written documents produced in connection with the data collection process.

5) Start the clock early: Everyone is concerned with the burden placed on the local libraries that will collect these network measures. One way of assessing the burden is by measuring how long it takes to complete the measurement task. How long does it take, who, to do what? The study team is interested in your planning time, as well as the time needed to collect each measure, and time needed to report the results.

6) Collect the data: The study team is interested in the results as well as the process of collecting the data.

7) Report problems and issues: The study team anticipates that when you start planning to collect the data, ambiguities in the definition of the data elements and other problems and issues will surface. Other problems and issues with each data element may surface when you actually start to collect the data. The study team is interested in what you do, why, any "judgment calls" or "what does that dumb study team mean by this" experiences you face, and what you decide to do

– no matter how silly or trivial they seem in hindsight. Please note and report these problems and issues to the project web site as well

8) How useful is each data element to your library: The study team is interested in how you rank the utility of each data element you collect. How would you use each data element (and why)? What do you think of the accuracy or credibility of each data element (having some experience collecting them)? What other data would be helpful (e.g., the results from the same data element from peer libraries locally or nationally)? How might the data element be used in combination with other data elements (e.g., circulation figures are commonly combined with some measure of population served to obtain say circulation per capita)? Use the following format:

Data element: Rank: (use number from 1=not at all useful to 5=extremely useful)
Comments:

9) Report data to project web site at http://www.albany.edu/~imlsstat/forms/fieldtest.html You are welcome to view the web site at any time. The site is designed to collect two types of data from your library: 1) The results of your data collection, and 2) A summary of the process and procedures used, the time it took, any work forms or written material you developed, problems and issues uncovered, your input on the possible uses for each measure, and any general comments you think will be helpful to the study team. Instructions for how to input the data are provided.

What Data Elements Should the Library Collect

The study team would like you to collect data for the following data elements. Each data element has a proposed definition and draft procedures.

Public Access Workstations

# Public access workstations

Definition: Count of the number of public access graphical workstations that connect to the Internet.

Procedure:

1) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions.

2) Count the number of graphical workstations with Internet access (no matter the speed or type of connection) that are made available to the public as of the end of the field test period.

In addition to personal computers, workstations may include "thin clients," graphical terminals, or networked computers if they are connected to the Internet and publicly accessible. Computers in computer labs used for public instruction if graphical and connected to the Internet should be counted. Public access graphical workstations that connect to the Internet that are used by both staff and the public should be counted if the workstation is used by the public for at least half of the hours during an average week that the library is open to the public. Reference desk computers used by staff to assist the public should not be counted.

3) Be sure to identify time-on-task data using the format discussed under the General Instructions.

3) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

4) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

5) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

# Public access workstation users

Definition: Count of the number of users of all of the library's graphical public access workstations connected to the Internet during a week [in the case of the field test].

Procedure:

1) Select a two-week period during the test period. One week equals the number of hours the library is open over a consecutive seven-day period.

2) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions. Identify the dates of the weeks chosen in the written plan. The number of users may be counted by observation (continuous or every X minutes), manually using registration sign up sheets, or via computer software such as *Historian*. You decide which method to use (and report your choice in the written procedure plan above). Indicate in your plan whether you observed (and for how long), used sign up sheets, or used software to collect the data for this element. If you used software please indicate the name, approximate cost, address, phone and web page of the software used.

3) Count the number of users of all of the library's graphical public access workstations connected to the Internet during each sample week chosen.

Count each user that uses the graphical public access workstations connected to the Internet, regardless of the amount of time spent on the computer. A user, who uses the library's workstations three times a week, would count as three users in the count. Internet use includes all types of usage including WWW, e-mail, telnet, chat, etc. The study team recognizes the potential difficulty of determining whether a user on a multi-purpose (cd-rom access, word processing, etc.) workstation is using the Internet. Do not include staff use of these resources.

4) Obtain an average weekly use figure by adding the total number of users each week and dividing by the number of weeks this data element was surveyed. For example during the first week 70 users were counted, 80 users were counted the second week. An average of 75 users is obtained and reported by adding week 1's users to week 2's [70 + 80 = 150] and dividing by the number of weeks surveyed [150 ÷ 2 = 75].

5) Be sure to identify time-on-task data using the format discussed under the General Instructions.

6) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

7) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

8) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

Maximum speed of public access Internet workstations

Definition: Indication of the maximum speed of public Internet access, e.g., 56kbps, ISDN, T1.

Procedure:

1) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions.

2) Determine what is the maximum speed of Internet access offered by the library to your users at your public access workstations as of the end of the field test period.

The number requested is not an average. This number is the maximum speed offered even if it is only at one public access workstation. The speed of Internet access offered to staff does not count here. Common measures of speed include: 56kbps, ISDN, T1. If you only offer Internet access by modem, look on the modem or in its manual for an indication of the maximum speed. If you offer Internet access via an Internet Service Provider (ISP) this is likely to be the source of your maximum speed connection. Contact your ISP to obtain the maximum speed you have purchased (or otherwise obtained).

3) Be sure to identify time-on-task data using the format discussed under the General Instructions.

4) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

5) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

6) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

Electronic Services

# Electronic reference transactions

Draft Definition: Count of the number of reference questions received electronically (e.g., via e-mail, WWW form, etc.) per week [in the case of the field test].

Draft Procedure:

1) Select a two-week period during the test period. The study team may propose that this measure be collected for the entire year in the final report rather than two weeks. Identify the dates of the weeks chosen in the written plan.

2) Prepare a written, step-by-step plan for collecting this data element, following the format outlined under General Instructions.

3) Count the number of electronic reference requests received during the each week of the sample period. Requests may be sent via e-mail, fax, a form on a web page,etc. Report an

electronic reference transaction as you would a face-to-face reference transaction. Thus, for example, one e-mail request may contain several reference questions taking varying time to complete. For example, one e-mail request contained 1 ready-reference question and one reference question that took 10-15 minutes to answer. Count the number of questions not the number of requests. So in the example you would report 2 as the number of electronic reference transactions.

4) Obtain an average weekly number of electronic reference requests received figure by adding the total number of electronic reference requests received each week and dividing by the number of weeks this data element was surveyed. For example during the first week 7 electronic reference requests were counted, 9 were counted the second week. An average of 8 electronic reference requests is obtained and reported by adding week 1's users to week 2's [7 + 9 = 16] and dividing by the number of weeks surveyed [16 ÷ 2 = 8].

5) Be sure to identify time-on-task data using the format discussed under the General Instructions.

6) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

7) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

8) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html>.

Virtual Visits

# Virtual visits to networked library resources excluding in-library use

Definition: A *visit* occurs when an external user connects to a networked library resource for any length of time or purpose (regardless of the number of pages or elements viewed). This may be a library OPAC or a library web page. In the case of a user visit to a library web site a user who looks at 16 pages and 54 graphic images registers one visit on the Web server. Due to various web server issues and differing software this measure is an *estimate* of the visits to the web site. One definition (from the *MS Site Server* manual) of a virtual visit is: "A series of consecutive requests from a user to an Internet site. If your log file data includes referrer data, then new visits begin with referring links external to your Internet site. Regardless of whether or not you have referrer data, if a user does not make a request after a specified time period, the previous series of requests is considered to be a completed visit."

Procedure:

1) The library must offer external electronic access to one or more of its resources. For example, a library web page, library OPAC, networked CD-ROM databases that can be accessed by library users located external to the library. If you do not offer such a service do not report on

this data element. Instead please contact the local coordinator of this field test or Joe Ryan <jryan@mailbox.syr.edu> if you have a question.

2) Select a two-week period during the test period. The study team may propose that this measure be collected for the entire year in the final report rather than two weeks. Identify the dates of the weeks chosen in the written plan.

3) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions. Indicate the software used to collect the virtual visit data. Identify the software data element chosen to collect virtual visits and (where possible) provide the software's definition for this element (often found in the software manual). In the field manual the study team will produce, we would like to include appropriate data elements and definitions from appropriate software. Your help here will make that possible. Report the method used and your success in excluding in library and staff use of your electronic services.

4) Count the number of virtual visits each week during the two-week period chosen. Exclude (where possible) virtual visits by staff and by library users using public access workstations in the library. This exclusion is made because the virtual visit count may be combined with the turnstile count of visitors to the library's physical premises to obtain a more representative count of visitors to the library. So the virtual visits from those using equipment within the library are excluded to reduce double counting.

Include (where possible) a count of the number of remote logins (sessions) to non-web-based library resources such as OPACS as well. This may require the use of several different software packages to achieve.

Configure software and local technology to collect virtual visit data. The virtual visit count is obtained using computer software often called log analysis software. All log analysis software may not track virtual visits the same way so the count obtained will necessarily be an estimate. Additional changes in local configuration may be required to ensure the same data is collected.

5) Obtain an average weekly number of virtual visits figure by adding the total number of virtual visits each week and dividing by the number of weeks this data element was surveyed. For example, during the first week 100 virtual visits were counted, 150 were counted the second week. An average of 125 virtual visits is obtained and reported by adding week 1's virtual visits to week 2's [100 + 150 = 250] and dividing by the number of weeks surveyed [250 ÷ 2 = 125].

6) Be sure to identify time-on-task data using the format discussed under the General Instructions.

7) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

8) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

9) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

Training

# Users trained

Definition: Count of the number of users trained in structured and informal training sessions conducted by the library. Structured means a course with a designed curriculum intended to demonstrate the use of a technology such as the Web, Internet searching, personal computing, etc. Informal includes contacts with users by library staff intended to demonstrate the use of library workstations, aspects of the applications available on those workstations, etc.

Procedure:

1) Select a two-week period during the test period. The study team may propose that this measure be collected for the entire year in the final report rather than two weeks. Identify the dates of the weeks chosen in the written plan.

2) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions.

3) Count the number of users trained each week during the two-week period chosen. Include a count of all users attending all formal, structured courses the library offers, the library contracts for, or that use library facilities. Include informal training of users at various public service locations in the library (e.g., the reference desk) whose duration is fifteen minutes or more. Include only training in the use of information technology or resources obtainable using information technology. Examples include use of the WWW, Internet searching, use of public access workstations or personal computers, subject-based resources available on the Internet, social implications of information technology (e.g., filtering and the public library).

Exclude staff training here. Exclude ready reference and traditional reference questions using pre-existing, locally developed guidelines. Exclude user training not in information technology related areas (examples above).

A user need not be a registered library user. A single individual may attend multiple training sessions of the same or different types, each of which is counted. So if a single individual attended a structured introduction to the Internet session and received a fifteen minute informal introduction to employment resources on the Internet at the reference desk the # users training count would increase by 2.

4) Obtain an average weekly number of users trained figure by adding the total number of users trained each week and dividing by the number of weeks this data element was surveyed. For example, during the first week 50 users receiving training were counted, 100 were counted the second week. An average of 75 users trained is obtained and reported by adding week 1's users

trained to week 2's [50 + 100 = 150] and dividing by the number of weeks surveyed [150 ÷ 2 = 75].

5) Be sure to identify time-on-task data using the format discussed under the General Instructions.

6) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

7) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

8) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

# Hours of user training

Definition: Count of the number of hours library staff spends training users in structured and informal training sessions conducted by the library. Structured means a course with a designed curriculum intended to demonstrate the use of a technology such as the Web, Internet searching, personal computing, etc. Informal includes contacts with users by library staff intended to demonstrate the use of library workstations, aspects of the applications available on those workstations, etc.

Procedure:

1) Select a two-week period during the test period. The study team may propose that this measure be collected for the entire year in the final report rather than two weeks. Identify the dates of the weeks chosen in the written plan.

2) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions.

3) Count the number of hours of user training each week during the two-week period chosen. Include all formal, structured courses the library offers, the library contracts for, or that use library facilities. Include informal training of users at various public service locations in the library (e.g., the reference desk) whose duration is fifteen minutes or more. Include only training in the use of information technology or resources obtainable using information technology. Examples include use of the WWW, Internet searching, use of public access workstations or personal computers, subject-based resources available on the Internet, social implications of information technology (e.g., filtering and the public library).

Exclude staff training here. Exclude ready reference and traditional reference questions using pre-existing, locally developed guidelines. Exclude user training not in information technology related areas (examples above). Exclude staff preparation time.

Report hours in quarter hour increments. For example a user training class lasting 70 minutes should be counted as 1.25 hours.

4) Obtain an average weekly number of hours of user training figure by adding the total number of hours of user training each week and dividing by the number of weeks this data element was surveyed. For example, during the first week 10 hours of user training were counted, 20 were counted the second week. An average of 15 hours of user training is obtained and reported by adding week 1's hours of user training to week 2's [10 + 20 = 30] and dividing by the number of weeks surveyed [30 ÷ 2 = 15].

5) Be sure to identify time-on-task data using the format discussed under the General Instructions.

6) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

7) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

8) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

# Staff trained

Definition: The total number of staff trained through formal/structured information technology training during a sample period. Structured means a course with a designed curriculum intended to demonstrate the use of a technology such as the Web, Internet searching, personal computing, etc.

Procedure:

1) Select a two-week period during the test period. The study team may propose that this measure be collected for the entire year in the final report rather than two weeks. Identify the dates of the weeks chosen in the written plan.

2) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions.

3) Count the number of staff trained each week during the two-week period chosen. Include all formal, structured courses the library offers, the library contracts for, or training sources external to the library (e.g., college and university courses, professional development courses at conferences). Include only training in the use of information technology or resources obtainable using information technology. Examples include use of the WWW, Internet searching, use of public access workstations or personal computers, subject-based resources available on the Internet, social implications of information technology (e.g., filtering and the public library).

Exclude informal staff training. Exclude training not in information technology related areas (examples above).

A single staff member may attend multiple training sessions of the same or different types, each of which is counted. So if a single staff member attended a course on using the Internet at a local community college and attended a workshop on Internet resources on aging the # staff trained count would increase by 2.

Staff include professional, non-professional, and volunteer staff as well as board members.

4) Obtain an average weekly number of staff trained figure by adding the total number of staff trained each week and dividing by the number of weeks this data element was surveyed. For example, during the first week 20 staff receiving training were counted, 30 were counted the second week. An average of 25 staff trained is obtained and reported by adding week 1's staff trained to week 2's [20 + 30 = 50] and dividing by the number of weeks surveyed [50 ÷ 2 = 25].

5) Be sure to identify time-on-task data using the format discussed under the General Instructions.

6) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

7) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

8) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

# Hours of staff training

Definition: Count of the number of total hours staff received formal/structured technology training.

Procedure:

1) Select a two-week period during the test period. The study team may propose that this measure be collected for the entire year in the final report rather than two weeks. Identify the dates of the weeks chosen in the written plan.

2) Prepare a written, step-by-step plan for collecting this data element, follow the format outlined under General Instructions.

3) Count the number of hours of staff training each week during the two-week period chosen.

Include all formal, structured courses the library offers, the library contracts for, or training sources external to the library (e.g., college and university courses, professional development courses at conferences). Include only training in the use of information technology or resources obtainable using information technology. Examples include use of the WWW, Internet searching, use of public access workstations or personal computers, subject-based resources available on the Internet, social implications of information technology (e.g., filtering and the public library).

Exclude informal staff training. Exclude training not in information technology related areas (examples above).

A single staff member may attend multiple training sessions of the same or different types, each of which is counted. So if a single staff member attended a course on using the Internet at a local community college lasting 6 hours and attended a workshop on Internet resources on aging lasting 1 hour the # Hours of staff training count would increase by .7 hours

Staff include professional, non-professional, and volunteer staff as well as board members.

Report hours in quarter hour increments. For example a training class lasting 70 minutes should be counted as 1.25 hours.

4) Obtain an average weekly number of hours of staff training figure by adding the total number of hours of staff training each week and dividing by the number of weeks this data element was surveyed. For example, during the first week 10 hours of staff training were counted, 20 were counted the second week. An average of 15 hours of staff training is obtained and reported by adding week 1's hours of staff training to week 2's [10 + 20 = 30] and dividing by the number of weeks surveyed [30 ÷ 2 = 15].

5) Be sure to identify time-on-task data using the format discussed under the General Instructions.

6) Identify any problems and issues that develop when collecting this data element and report them on the project web page.

7) Assess and rank the utility of this network measure and report this to the web site using the format suggested under General Instructions.

8) Report this information following the instructions provided to the project web site <http://www.albany.edu/~imlsstat/forms/fieldtest.html >.

APPENDIX F – ONLINE DATABASE VENDOR FIELD TEST METHODOLOGY

INTRODUCTION

This document serves as a both an outline and instruction manual for field-testing the **database** data elements/statistics. North Carolina through NC LIVE, Maryland through Sailor Operations Center (SOC), and Delaware through DelAWARE will be field-testing the database data elements/statistics. The study team developed the document to better aid the study participants (Maryland, North Carolina, Delaware, and licensed database vendors) in the field-testing phase of the project. The documentation includes:

- Information regarding what is expected of both the study participants and licensed database vendors;
- Detailed definitions of the database data elements/statistics;
- Preferred method(s) of collecting and reporting the requested information;
- Study team contact information; and
- Internet links to online help and comment forms developed by the study team.

Together, these items comprise the database field test component of the study.

EXPECTATIONS

Study Participants

The study team intends to work with Maryland, North Carolina, and Delaware to collect the database usage statistics. We anticipate that the study participants will do the following:

- Establish a contact person:
  - Maryland – at Gale/IAC through the state library and Sailor Operations Center (SOC) or Division of Library Development and Services (DLDS) management structures;
  - North Carolina – at Ebsco, OCLC, and UMI through NC LIVE and state library management structures to explain the nature of the project, the desired data elements, data collection activities, and other relevant information; and,
  - Delaware – at Ebsco and WorldBook through the DelAWARE and state library management structures.

- Work collaboratively with the study team and vendor staff to get database usage reports for analysis purposes in a standardized electronic file format;

- Test the accuracy, method, and format of the data reported;

- Determine the types of breakdowns desired/most useful to the database licensee;

- Discuss, for each data element, any problems or issues that had to be resolved during data collection and how the issues were resolved; and

- Suggest how the data collection effort for each data element might be improved in the future.

The above will assist the study team, participants, and vendors identify key issues concerning the availability, collection, analysis, and dissemination of online database vendor statistics.

Vendors

The study team is asking each licensed database vendor to attempt to collect four database statistics:

1. Number of unique electronic titles;
2. Number of electronic network sessions;
3. Number of electronic network queries/searches; and,
4. Number of electronic networked items examined.

As such, the study team expects each licensed database vendor to do the following:

- Work collaboratively with study team, the project coordinators in Maryland and North Carolina, and the management teams for the networked resources in each state;
- Communicate with the study team to identify and resolve any key data collection, definitional, or other issues;
- Collect the statistics as defined by the study team (and ICOLC);
- Provide a detailed, step by step description of the process employed to collect the statistics including any forms developed to collect them;
- Include as many statistical refinements where applicable; and
- Suggest how the data collection effort for each data element might be improved in the future.

This approach will provide the study team with useful information regarding the vendor issues in providing a variety of database usage data in a number of formats.

DATA COLLECTION

This section will provide the study participants in Maryland and North Carolina and the licensed database vendors the following:

- Study team contact information;
- Links to online help and comment forms; and
- Instructions on how to collect the database data elements/statistics.

Study Team Contact Information

The study team is aware that questions and issues will arise during field-testing. Thus, it is necessary that the study participants know whom to contact. The following two study team members to contact are:

Name	Phone Number	Fax Number	Email Address
John Bertot	(518) 442-5125	(518) 442-5367	<jcbertot@cnsunix.albany.edu>
Colleen Ostiguy	(518) 442-5124	(518) 442-5367	<imlsstat@cnsunix.albany.edu>

Online Forms

The study team created online comment and help forms. When a study participant submits an online form it is:

- Sent immediately via email to a study team member; and
- Depending upon the question/comment, answered via email or telephone.

The online help and comment forms are located at: <http://www.albany.edu/~imlsstat/database.html>

Field Test Instructions

The following are instructions for the collection and reporting of the five database data elements/statistics.

Number of Unique Electronic Titles

Definition: Count the number of unique online database titles available at the library.

Participant Responsible for Collection: Licensed Database Vendor(s)

Instructions for Collection:
1. Count and identify the number of online database titles available from the entire host/service to which the licensee subscribes.
2. Count and identify the number of **full text** online database titles available.
3. Count and identify the number of **abstracted** online database titles available.
4. Report statistics to study team in electronic form.
5. Email statistics to <imlsstat@cnsunix.albany.edu>

Number of Electronic Network Sessions

Definition: Count of the number of initial sessions (logins) to the online database.

Participant Responsible for Collection: Licensed Database Vendor(s)

Instructions for Collection:
1. Count the number of logins to **entire host** to which the licensee subscribes for month of January 2000.
2. Breakdown number of logins to entire host by time of day and IP address.
3. Count the number of logins to **each database** for month of January 2000.
4. Breakdown number of logins to each database by time of day and IP address.
5. Report statistics to study team in electronic form, e.g. ASCII delimited file or downloadable file.
6. Email statistics/file location to <imlsstat@cnsunix.albany.edu>

Number of Electronic Network Queries/Searches

Definition: Count the number of searches conducted in the online database.

Participant Responsible for Collection: Licensed Database Vendor(s)

Instructions for Collection:

1. Count the number of searches conducted in **entire host** to which the licensee subscribes for month of January 2000.
2. Breakdown number of searches conducted in entire host by time of day and IP address.
3. Count the number of searches conducted in **each database** for month of January 2000.
4. Breakdown number of searches conducted in each database by time of day and IP address.
5. Provide the search strings/queries conducted in **each database** for month of January 2000.
6. Report statistics to study team in electronic form, e.g. ASCII delimited file or downloadable file.
7. Email statistics/file location to <imlsstat@cnsunix.albany.edu>

Number of Electronic Network Items Examined

Definition: Count the number of online database content views. View defined as a user looking at an abstract or full text article

Participant Responsible for Collection: Licensed Database Vendor(s)

Instructions for Collection:

1. Count the number of content views of abstract or full text article(s) in **entire host** to which the licensee subscribes for month of January 2000.
2. Breakdown number of content views to entire host by:
   - o **User action** (printing, emailing, or saving to disk); and
   - o **Type of documents** (PDF, text, image, or video).
3. Count the number of content views of abstract or full text article(s) in **each database** for month of January 2000.
4. Breakdown number of content views in each database by:
   - o **User action** (printing, emailing, or saving to disk); and
   - o **Type of documents** (PDF, text, image, or video).
5. Report statistics to study team in electronic form, e.g. ASCII delimited file or downloadable file.
6. Email statistics/file location to <imlsstat@cnsunix.albany.edu>

Internet Subscription Material Expenditures

Definition: Total expenditures for online Internet material subscription expenditures (vendor databases). May include one-time start-up cost as well as recurring costs.

Participant Responsible for Collection: Study participants in Maryland, North Carolina, and DelAWARE.

Instructions for Collection:
1. Calculate the one-time start-up fee(s) for each licensed database(s).
2. Calculate the recurring cost(s)/fee(s) for each licensed database(s).
3. Itemize **each fee** so study team can understand how final figures were configured.
4. Report information to study team.
5. Email statistics to <imlsstat@cnsunix.albany.edu>

EMAIL FOLLOW-UP TO VENDORS

During this week I will be contacting a few vendors to request their participation with the "database usage statistics" segment of the project. And, we have secured participation from three statewide networks: Maryland's Sailor Public Online Information Network, North Carolina's NCLIVE, and Delaware's DelAWARE. From contacts at each of these state networks we understand that Gale has agreements with Maryland and North Carolina.

We are requesting that you work with us in identifying what statistics are currently delivered to these customers and if the monthly reports are available in an ASCII comma delimited format. And, for the purposes of standardizing what database use statistics are collected and reported to customers, we are asking that you participate in an alpha test of reporting in a standardized format and sequence. The alpha test period is December 1990-February 2000.

Let me begin with the standard data elements in the four (4) identified major categories of data collection:

1. Number of unique electronic titles: count the number of unique titles in online databases available in the library;
2. Number of electronic network sessions: count the number of initial sessions (logins) to the online database;
3. Number of electronic network queries: count the number of searches conducted in the online database; and
4. Number of electronic network items examined: count the number of online database content views. View defined as a user looking at an abstract or full text article.

Within each category there is more information requested. I have attached a Word document with further description of each data category.

As far as standardized format and sequence of usage reports, we are asking participating vendors to report as follows:

1. ASCII text, comma delimited files
2. usage reports include the following information:

a. customer label
b. IP address for each library in license (we are trying to collect data by library and IP address, so be as specific as you can with this item. Ideally we want usage reports by each IP address in a library license)
c. total sessions
d. total rejected sessions (turn-aways)
e. databases searched
f. number of searches by subject, providing top 20 subjects searched in each database)
g. queries by database examined - citation, abstract, full text, type of document (ASCII text, pdf, color image, sound clip, etc.)

I cannot tell you how important this project is both for customers and for vendors. If we can in any way influence the process for standardizing data use reports requested of vendors this project has done its job. And, it standardizes what libraries are requested to report in state and national library surveys. Clearly, we create a win-win situation for all concerned.

Our timeline for knowing the extent to which you can participate and provide the level of use data in the format we request is December 10, 1999. Since XXX is such a significant presence in the library database market and with our test libraries, your participation is appreciated. And, XXX participation only underscores the company's commitment to improving services to customers and the users they serve.